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Inside Dope

By GEORGE
F. TAUBENECK



Learn to live and laugh —
thus delay your epitaph

Story of the Week
Everybody Is Happy
**There's Profit In
LEISURE**
Male vs. Female
Social Inventions

Story of the Week

Invariably Johnnie fidgeted through Parson Browne's long-winded prayers.

To Johnnie's surprise, when the parson was asked to pray at the family dinner table, he did the "grace" in 32 seconds flat.

"When you're hungry you don't pray so long," Johnnie noticed out loud.

Everybody Is Happy

New Year's Day headline in the *Dayton Daily News*:

"Drunkometer Tester I New Tipsy Driving Gas."

So who's tipsy?

There's Profit In LEISURE

January traditionally is a time for predictions and sooth-saying. Publications like ours usually print forecasts for the coming year fostered by industry economists.

Today we depart from this foreordained script. Herewith is a crystal-ball job which ignores tomorrow. Instead, it concentrates on the Januaries of 1960-67-70 and onward. It's the promised additive to our Dec. 5 editorial, which outlined why Big Business is investing heavily in an Explosive Future, and hinted at a new economic theory based upon unrealized utilization of unexpected and as yet undigested Leisure.

It's our honest opinion that:

FORTUNES in the next two decades will be made by men canny enough to capitalize on the forthcoming four-day work week. (Don't bet against that 32-hour week; it could become standard within 10 years—or even less!) Nor should it strain credulity that a 28-hour week should follow—if we heed prophets who hail the forthcoming magic of electronics, automation, solar and nuclear power.

As a matter of fact, fortunes already are being made by purveyors of stuff which modern 40-hour a week workmen buy to prove that they have excess time on their hands. Quick examples:

(1) Multiplying varieties of clothing for males, females, and children;

(2) Sports paraphernalia: bowling, fishing, and hunting

(Concluded on Page 16, Col. 1)

Few Lines To Debut at Jam Packed Marts

Appliance Firms Seen Going Heavier Into Air Conditioning

CHICAGO, Jan. 9—More than 50,000 retail store owners, buyers, manufacturers' representatives, and trade personnel are expected for the annual winter home furnishing markets which open here today to run through Jan. 20.

This will be the biggest attendance in the show's history, according to officials of the Merchandise Mart and the American Furniture Mart, the two spacious multi-floor buildings which house manufacturer's exhibits. Hotel space is incredibly tight.

In the refrigeration, air conditioning, and "white goods" fields, however, little is expected in terms of new products or "specials" of an exciting nature.

According to representatives of top full-line manufacturers who were here in advance of the show's opening, their new models either have been introduced already or (in some cases) (Concluded on Back Page, Col. 4)

Williamson Redesigns Heating, Cooling Line

CINCINNATI—Williamson Co. recently introduced its 1956 lines of console type air conditioning units, compressors, and furnaces, redesigned for compactness and color styling.

"Wethermatic" console type air conditioning units have been changed to suit installation of 2, 3, or 5-ton types in a single cabinet size, the company stated.

New units include both space and duct type models. The 1956 line provides for a flange around the filter opening when used in a duct system as a companion unit for a gravity-type furnace, it was further said.

Color styling in the complete heating and cooling line is another innovation, according to the firm. Wethermatic models feature two-tone green finish.

Trend in modern homes, the company commented, is to bring heating and cooling units into living areas, as in rathskellers in basements or in utility rooms. Williamson's new color styling blends with almost any decorating plan, it was reported.

Console type models in 2, 3, and 5-ton sizes may be used alone as space cooling units, with a duct system for remote cooling, or in conjunction with existing furnaces where an air distribution blower is not available, the manufacturer declared.

Outdoor compressors units of Wethermatic systems are suc-

Year-Round Units Govt. Will Air Condition Most of Its New Buildings

WASHINGTON, D. C.—Most field of government construction of the new buildings constructed by the Federal government in the future will be air conditioned, the General Services Administration announced recently.

This will result from acceptance by the G.S.A. of a series of recommendations made by a private industry committee that recently surveyed the entire

1956 Philco Line Features Custom Design Concept

PHILADELPHIA—A "new concept in custom appliance design" called "Philco Custom Sectional Appliances" will be introduced for 1956 by Philco Corp.'s Appliance Div. along with new developments in its air conditioning line.

These new appliances—an "elevator" oven, surface units mounted in a matching cabinet, refrigerator and freezer in individual identically styled and exterior size cabinets—are designed as custom built-in appliances, but they do not require "building-in," the company said.

A Philco electric sink with an automatic front-opening, top-loading dishwasher and a food waste disposer are additional sections available in the custom line. These appliances may be purchased one-at-a-time or as a complete kitchen.

Other highlights of Philco's 1956 line of electric appliances and air conditioners are:

A "do-it-yourself" central air conditioning kit for use with a new 2-hp. room air conditioner designed for remote installation; room air conditioners that have automatic temperature control for both heating and cooling; a master combination refrigerator and freezer with a total capacity of 15.8 cu. ft.; two new upright freezers with dispenser shelves in the doors; two new colors—pastel blue and yellow; (Concluded on Page 39, Col. 1)

York Earnings Down But Sales Improve In Last 2 Months

YORK, Pa.—Sales and earnings of York Corp. for the year ended Sept. 30 were down from fiscal 1954 but by Nov. 30, the company's backlog of unfilled orders rose to \$27,605,000, compared with \$18,247,000 a year earlier, according to S. E. Lauer, president.

Lauer attributed this improvement to "greatly accelerated bookings during this two-month period by the industrial division which produces and markets field-assembled air conditioning and refrigeration systems."

York's sales for fiscal 1955 totaled \$82,713,623, against \$93,272,679 in fiscal 1954. Earnings amounted to \$2,426,236, equal

(Concluded on Page 4, Col. 5)

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& AIR CONDITIONING
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in the
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THERMOBANK

Here are the major improvements

A NEW HEAT SOURCE - Instead of using only the sensible heat of the THERMOBANK, the new "L" THERMOBANK now utilizes both its sensible heat plus its latent heat of fusion by actually freezing a tube of ice around its reevaporator coil during the defrost. (The "L" stands for latent). This, coupled with significant improvements in the design of the reevaporator coil, gives the "L" THERMOBANK four to five times more heat storage for instant defrost and complete reevaporation.

NO LIQUID REFRIGERANT TO COMPRESSOR - With the vastly larger amount of heat now available in the "L" THERMOBANK, no liquid can return to the compressor during defrost. This is a singular and distinctive feature of the "L" system vastly different from any other automatic hot gas defrost system now available.

CONSTANT CRANKCASE PRESSURE - The "L" system maintains a predetermined low crankcase pressure, thus permitting

the use of standard low temperature compressors without danger of motor overloading during the defrost, or oil foaming upon resumption of the refrigeration cycle. The low temperature compressors are less costly since they deliver more BTU's per horsepower.

NO EXTRA SUPERHEAT DUE TO REEVAPORATOR - On larger systems the suction line by-passes around the THERMOBANK during normal operation, thus eliminating any superheat pick-up from the bank by the suction gases during normal operation. This is very important with F-22.

"LOW-LOW" TEMPERATURES - Extremely low temperatures are now achieved with the "L" THERMOBANK and a complete line of "Low-Low" systems are now available.

NO WINTER PROBLEMS - The "L" THERMOBANK can be housed in an unheated space, thus making possible the use of the "L" THERMOBANK in any location, even the arctic circle.

Stuart-Warner Expanding Air Conditioning, Names Judd Gen. Mgr. of U.S. Machine Div.

CHICAGO—The appointment of William E. Judd as general manager of the U. S. Machine Div. of Stewart-Warner Corp. has been announced by Bennett Archambault, president of Stewart-Warner.

The appointment, to become effective Jan. 9, 1956, will fill the vacancy to be created by the retirement of Carl J. Winkler, Sr., on that date. Winkler has been head of U. S. Machine, manufacturer of a comprehensive line of oil and gas heating equipment and air conditioning systems for domestic, commercial, and industrial requirements, since it was founded and since its subsequent purchase by Stewart-Warner in January, 1953.

"It is the intention of Stewart-Warner that the business of U. S. Machine Div. be expanded greatly from the present level.

A magnificent opportunity exists to build the division into a position of real national leadership in the large and rapidly-growing heating and air conditioning fields," Archambault said in making the announcement of Judd's appointment.

Judd, in his 13 years with Stewart-Warner, has represented the South Wind Div. in aircraft heater sales and service; was named general sales manager of that division in 1949; was appointed assistant to James S. Knowlson, then president as well as chairman of the board, on Jan. 1, 1952.

Norge Names Nighswander

CHICAGO—Dan R. Nighswander has been appointed automatic clothes dryer sales manager of Norge Div., Borg-Warner Corp.

Govt. Eases Requirement In New Loan Plan for Retailers, Wholesalers

WASHINGTON, D. C.—Wendell E. Barnes, head of the Small Business Administration, announced recently that requirements on Federal loans to small retailers and wholesalers have been relaxed.

In the past, such wholesalers and retailers have not been able to get SBA loans because it is too difficult for the agency to appraise the assets they offered as collateral for the loan.

Under the new plan, the government will make loans to small wholesalers and retailers on the basis of appraisals made by independent banks which will make part of the loan, according to Barnes. He said the government's share will be limited to 75% of the full amount or \$15,000, which ever is smaller.

Barnes explained that by agreeing to accept the appraisal of a bank which is willing to lend part of the money, SBA opens the way for the retailers to get Federal aid.

Many small retail and wholesale firms operate in rented quarters and their only assets are fixtures, inventories, and accounts receivable, Barnes pointed out. These assets have been acceptable to SBA as collateral but it has been hard for the agency to make a proper appraisal, he noted.

Hood Denies FTC Charges of Special Dairy 'Giveaways'

WASHINGTON, D. C.—H. P. Hood & Sons, Inc., Charleston, Mass., a major New England producer of ice cream and other frozen dairy foods, has denied Federal Trade Commission charges in giving special deals to customers in return for dealing exclusively in its products.

The commission, in a complaint issued Oct. 3, charged the firm with furnishing display equipment and other services which the smaller producer was unable to match. The complaint alleges that the smaller producer might either go bankrupt or merge with the larger companies and that the resulting injury to competition would violate the fair competitive standards of the FTC Act.

The firm denies giving "facilities, loans, equipment, services, and discounts or rebates" to its customers, but states that if any were given there was no intent to drive out competition.

Any services, the firm adds, were "made available in accordance with long established industry practice and custom" and were "to meet like competitive practices generally prevailing in the industry."

Wisconsin Firm Formed

MILWAUKEE—Modern Heating & Air Conditioning, Inc. has been formed here, with an authorized capital stock of 500 shares of common at par value of \$1 per share.

Incorporation papers were signed by Harold O. Mehlberg, Eugene A. Goggins, and Arthur C. Pope.

KRAMER TRENTON CO. • Trenton 5, N.J.



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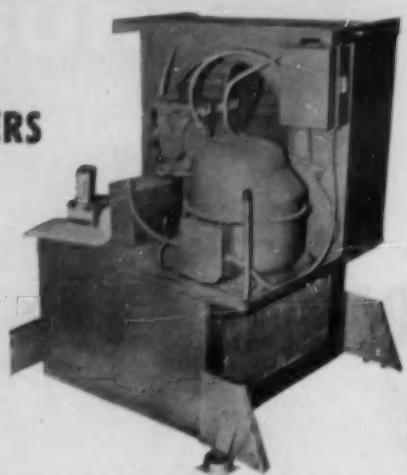


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Builders' Show--

(Concluded from Page 1, Col. 3)

Wednesday; and a demonstration throughout Wednesday on building a house with tilt-up walls and components.

At sometime during the afternoon, the demonstration will include the installation of a furnace, ducts, registers, air conditioning, plumbing tree, electric panel, and insulation.

The tentative program for the convention did not specify the exact location of these discussions and demonstration. The convention and exposition is being spread between the Conrad Hilton and Sherman hotels and the Chicago Coliseum.

More than 450 exhibitors are scheduled to display their wares for the nation's builders, beginning at 1 p.m. on Sunday. Exhibits will be scattered over all three locations. Shuttle bus service will connect the areas.

G-E Discontinues Distributing Corp.

NEW YORK CITY—General Electric Distributing Corp., a wholly-owned subsidiary of the General Electric Co., has been discontinued as a separate corporation, it was announced recently.

The three components of the corporation, the G-E Supply Co., the Hotpoint Appliance Co., and the G-E Appliance Co. will become integral parts of the parent organization.

The announcement said that the organization change is a part of the company's program of clarifying and simplifying the General Electric organization structure and that the identity and type of wholesale function conducted through the three businesses are not being changed.

The various General Electric product departments which use these and other wholesale channels of distribution continue to employ the same channels as previously in the marketing of their products, the announcement said.

Under the new arrangement, the G-E Supply Co., with Charles R. Pritchard as president and general manager will become a division of the company's distribution group, and the G-E Appliances Co., with Paul A. Tilley as president and general manager will become a department of the Appliance and Television Receiver Div.

The Hotpoint Appliance Sales Co., with H. Boone Zimmerman as general manager, will become a department of the G-E Supply Co. Div.

York--

(Concluded from Page 1, Col. 3)
to \$1.72 a common share, compared with \$2,912,894, or \$2.12 a share.

Lauer said only 5% of 1955 sales included items used for defense and other extraneous equipment, compared with 13% a year earlier.

He told stockholders that sales for the last six months of fiscal 1955 exceeded the first half by 56%. He said "stringent operating economies" were imposed and higher prices were announced in late September. As a result, Lauer stated, earnings for the second half were up 33% over the like 1954 period.

The backlog of unfilled orders at the end of the year totaled \$22,242,000, against \$18,600,000 a year earlier. By Nov. 30, 1955, two months after the end of the fiscal year, the backlog increased to \$27,605,000.

Lauer said the company's plant expansion program has not proceeded "at the rate anticipated in 1954." This was due to changed conditions primarily in the room unit market.

The York president also told stockholders the company is studying possible acquisition of existing plants and facilities to supplement its long-range plan.

York has been in the market for some time for a heating equipment producer "to aid in its move toward year-round residential heating and air conditioning equipment."

COMING in your mail...Free Record

* Watch for ill Hear Sat. Friday of Dragnet fame give the plain facts about the revolutionary new air conditioning development by Lennox.

SEE THE LENNOX

AD ON PAGES 14-15



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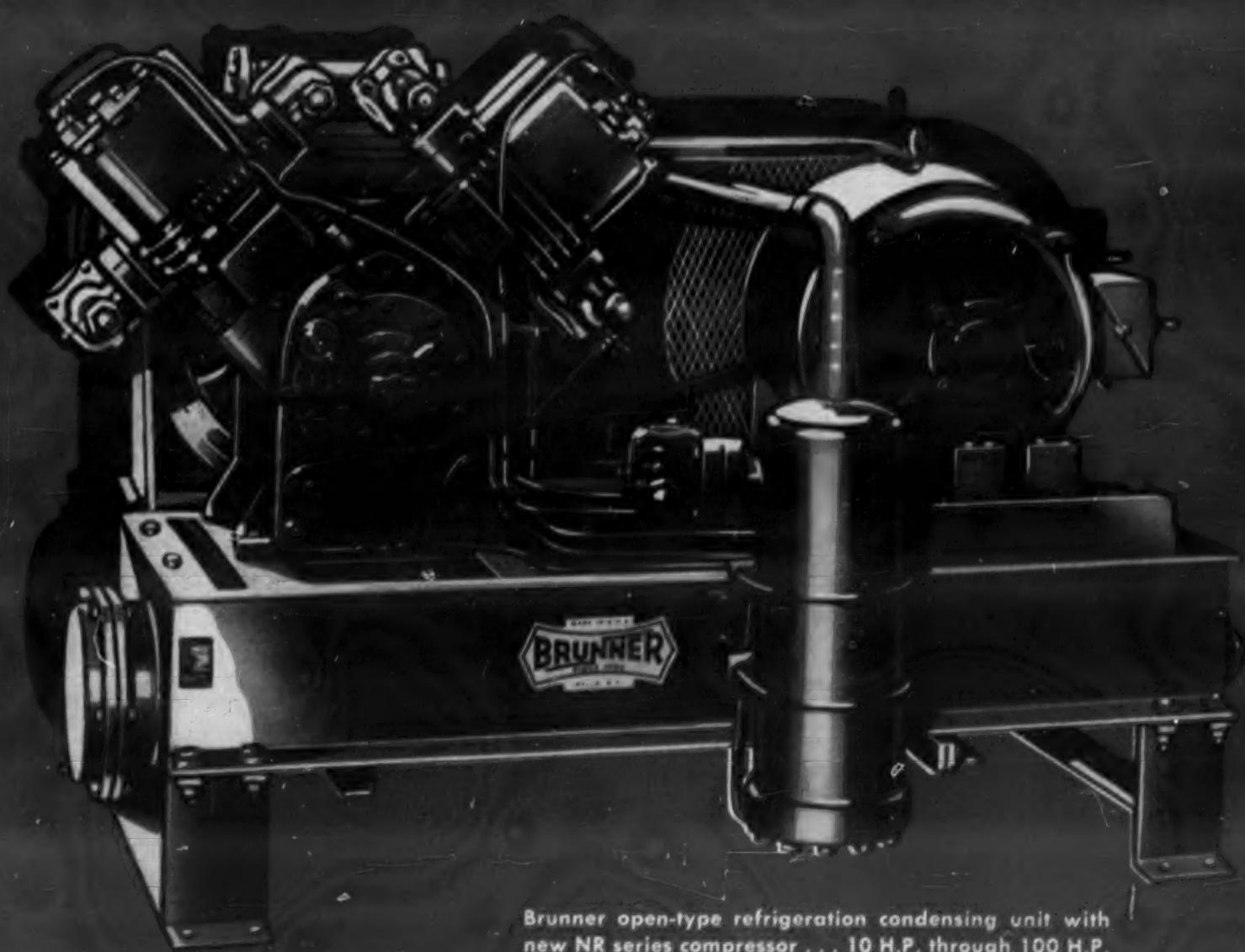


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Brunner open-type refrigeration condensing unit with
new NR series compressor . . . 10 H.P. through 100 H.P.
Brunner manufactures the most complete line of con-
densing units available from a single source.

Room Air Conditioners

Air Conditioning & Refrigeration News, January 9, 1956

Air Conditioners Okay Unless Barred In Rental Agreement, N. J. Rules

TRENTON, N. J.—Some details of the case leading to a ruling by the New Jersey rent control director that installing an air conditioner was not a cause for eviction were brought to light recently.

In his ruling, reported on page 1 in the Dec. 26 issue of the NEWS, Director Chester K. Ligham asserted that under our present standard of living, "air

conditioning has become a necessary adjunct of comfortable living and unless their use is expressly prohibited under the rental agreement, the tenant has as much right to install one as to use a toaster, vacuum cleaner, or other electrical appliance, except where their use would constitute a fire hazard or adversely affect the safety and comfort of others."

The case leading to the ruling started in 1953. At that time, a tenant installed an air conditioner without his landlord's knowledge. Both parties were unnamed in the description.

The landlord, when he found out about it shortly after the installation, orally requested the tenant to remove it. Eleven months later, the tenant and 10 other tenants were notified in

writing that air conditioners were prohibited. Reason given was that the electrical capacity of the building could not carry the load.

The landlord then applied for and received an eviction order against the tenant. The tenant appealed the order to the county rent control review board. The landlord was upheld. So the tenant appealed to the state rent control office. Ligham cancelled the eviction certificate for the reason given above.

West Penn Power Raises Minimum Service Entrance Requirements

PITTSBURGH — West Penn Power Co. has announced that it raised its minimum service entrance requirements from 70 to 100 amperes effective Jan. 1.

The new requirement applies to both the conductors and entrance equipment in all individual installations having more than one branch circuit, the utility said.

Wiring rules for multiple installations were also changed to require service entrance conductors for two apartments to have a minimum rating of 125 amps., for three and four apartments a minimum of 150 amps., and for five and six apartments, a minimum of 170 amps.

The changes were necessitated, the company said, by the fast growing electrical loads of West Penn customers and resulting demands on their wiring systems. It pointed out, however, that 75% of all homes in its territory already have three-wire entrances.

The utility declared that it has been installing entrance requirements equivalent to the new 100-amp requirement at no cost to customer or dealer.

Under the present policy, it said, any present customer who buys an electric range, water heater, or dryer, will have their service entrance made adequate.

Most of these installations will have sufficient capacity to serve 240-volt room coolers and some electric space heating equipment, it noted.

Servel Appoints Prince to Post

EVANSVILLE, Ind. — Martin A. Prince has been appointed product manager for room air conditioners and portable Wonderbar refrigerettes at Servel, Inc., it was announced recently by Richard S. Testut, vice president and general manager of the company's home appliance sales division.

Before joining Servel, Prince worked nine years at International Harvester Co., most recently as a refrigeration specialist on room air conditioners.

Mathes Names Associate Mfr.

FORT WORTH, Texas—Stern, Brenner & Arey Enterprises, Inc. has been selected by the Mathes Co., manufacturer of air conditioning equipment, as an associate manufacturer of Mathes commercial units in the Washington, D. C. area.

The company already distributes Mathes residential units.

Homer Arey, general manager, will have over-all charge of Stern, Brenner & Arey's air conditioning operations while Herbert Arey will be in charge of engineering and estimating.

A. S. Wolloch will supervise sales and Albert F. Viands will be in charge of installation and service.



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Now RCA WHIRLPOOL takes the gamble out of the air conditioning business. Because only RCA WHIRLPOOL guarantees hot weather during your prime selling season. If temperatures are abnormally cool during May and June, you are paid an extra promotional allowance on all units received through April 30th. You can't lose—because payments are made whether or not your RCA WHIRLPOOL Air Conditioners have been sold. See your distributor for complete details.



SEE THE FIRST ELECTRONIC FILTER FOR ROOM AIR CONDITIONERS!



ORDINARY FILTERS—Conventional mechanical filters screen out average-size particles of dust, dirt and pollens. Microscopic airborne particles slip through into your room along with the cool air.



NEW ELECTRONIC FILTER—developed first by RCA WHIRLPOOL, is 300 percent more effective than ordinary filters in room air conditioners. Traps particles as tiny as 1/25,000 of an inch, doesn't stop air flow.

SEE THE COMPLETE NEW 1956 LINE!



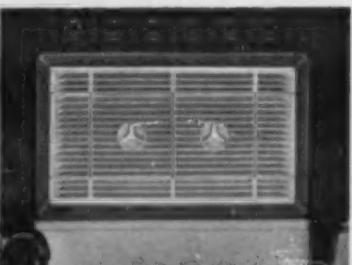
CUSTOM MODELS with new Electronic Filter in $\frac{1}{4}$, 1 and $1\frac{1}{4}$ H.P. capacities. Also in 2 H.P. for extra-large rooms. Features: infinite air speed control, built-in thermostat, pushbutton controls in "Climate Tuner" panel, air direction control.



DELUXE MODELS at popular prices, in $\frac{1}{4}$, 1 and $1\frac{1}{4}$ H.P. capacities. Features: built-in thermostat, infinite air direction control. "Heart-of-Cold" compressor, separate power switch. Beautifully styled in shades of mocha and ivory.



CASEMENT WINDOW MODELS with advanced features, in $\frac{1}{2}$ and $\frac{3}{4}$ H.P. capacities. Fits a window up to 23" wide. Has built-in thermostat, adjustable grille, simplified controls. "Hush-a-Bye" fans, smart modern styling by Henry Dreyfuss.



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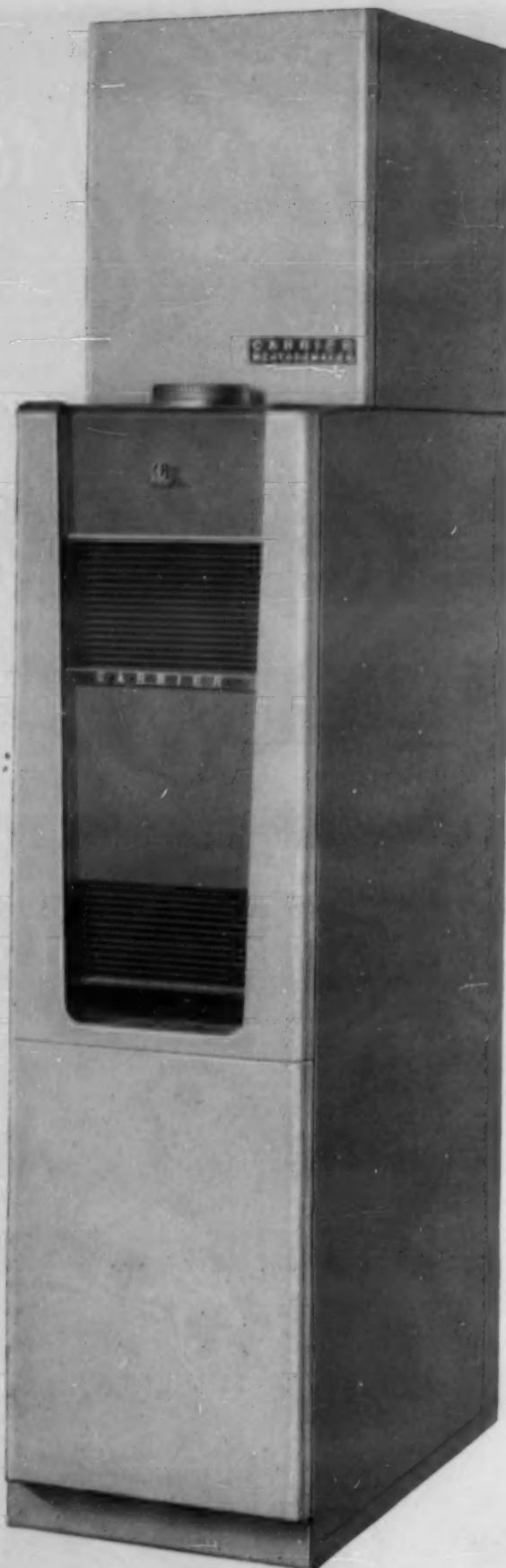
For more information about products advertised on this page use Information Center, page 26.

Now there are Carrier furnaces for you to sell, too!



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...the furnace with a future



Newest addition to line will give you

Carrier furnaces will end dealers' slack months

With these new Winter Weathermakers, Carrier brings you a 365-day-a-year busy season. As a Carrier dealer there isn't a home heating or cooling problem you can't solve. To begin with, there's a Winter Weathermaker for every type of home, every climate, every kind of gas or oil—33 models in all.

And the Winter Weathermaker is "the furnace with a future" because it's all set for summer air conditioning—with matching coil casings, ample fan capacity, and a special heating and cooling thermostat. Future business in summer cooling is built right into each furnace.

So cash in on Carrier, the *year-round* profit line! To start the money pouring in, call your nearest Carrier distributor. You'll find his name listed in the yellow pages of your classified telephone book. Or write direct to Carrier Corporation, Syracuse, New York.



This is the new Carrier Winter Weathermaker—"the furnace with a future." The inexpensive coil casing (shown on top) replaces the old-fashioned plenum and the cooling coil may be inserted during the initial installation or at some future date. This upflow furnace is available for either oil or gas and in capacities from 75,000 to 210,000 Btu/hr input.



Carrier Downflow Winter Weathermaker
—available gas or oil fired in capacities from 75,000 through 150,000 Btu/hr input. Matching cooling coil section fits neatly under the furnace.

Carrier Horizontal Winter Weathermaker
—available gas or oil fired in capacities from 85,000 to 231,000 Btu/hr input. Matching cooling coil section fits in ductwork as shown.

Exclusive New Weathermaker Control Center.
Switches from heating to cooling. The word "COOL" on the thermostat reminds the owner he can add cooling to his furnace at any time.

America's leading air conditioning year-round profits



Carrier Year-round Weathermaker—for new homes or to replace worn-out furnaces. Heats and cools an entire house. Water-cooled or air-cooled. Uses gas or oil for heat. Capacities from 1.7 to 7.5 tons.



Carrier Summer Weathermaker—for homes with steam or hot water heat or with no central heat at all. Has its own fan and filter. Uses a separate duct system. Available in capacities from 2 to 5 tons.



Carrier Conversion Weathermaker—for existing homes with upflow furnaces. Fits any standard warm air furnace. With air-cooled refrigerating section, it comes in capacities from 2 to 5 tons.

Carrier Conversion Weathermaker—for existing homes with downflow furnaces. Fits neatly below the furnace which is raised only about 12 inches. Available from 2 to 5 tons. Requires no water.

Carrier Conversion Weathermaker—for existing homes with horizontal furnaces. Fits in duct alongside the furnace. Has air-cooled refrigeration section for outdoor location. From 2 to 5 tons capacity.

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AIR CONDITIONING
REFRIGERATION
INDUSTRIAL HEATING



What's Ahead for Home Air Conditioning 1956-1965

Mfrs. Views Recorded on Problems, Mergers, Trends for Next Decade

NEW YORK CITY—"Is the residential air conditioning industry keeping pace with the times?"

Kentner L. Wilson, manager, heating controls division, Minneapolis-Honeywell Regulator Co., tried to answer this question before a meeting of the National Warm Air Heating & Air Conditioning Association here, Nov. 30.

"It seems the necessity for trying to peer through the barrier of time was never more urgent in the residential part of the air conditioning industry than it is today," he declared as he mentally transported his listeners into the next decade, attempting to give a word picture of the field in 1965.

Recognizing his limitations in trying to predict the future and determine if the heating and cooling industry is making adequate progress to meet challenges and opportunities of the next 10 years, Wilson called in the M-H market research staff to conduct interviews all over the country.

Researchers tape recorded voices and Wilson played them for his NWAHACA audience.

Believing that those who will write the industry's history in coming years were among his hearers, Wilson turned to his firm's interviews of manufacturers. Large and small, regional and national companies had their executives queried.

Mfr. 1: Before looking ahead 10 years, let's look back 10. Following the trend of the past, more progress will be made in reducing the size of equipment and making it more pleasing in appearance. By 1965, I think we'll have comfort generating stations which will include heating and cooling as well as dust removal, humidity control, and maybe other features not contemplated at this time. As to fuels, there'll be research on atomic and solar radiation but they won't be economically feasible by 1965.

Int.: Do you see many changes in the way you'll be doing business?

Mfr. 1: Today's dealers are depending on price to sell our products. That's not all that is needed. So, I look for a new type of dealer to emerge. He won't have anything to do with installation and service but will be interested only in promotion and sales.

Int.: What do you see for the heating-cooling industry in 1965?

Mfr. 2: I've been in business a good many years, starting back in the coal days. It doesn't make much difference what the industry comes up with in the way of new equipment. The success of any company will depend on its ability to merchandise. I don't think heating units will be much different 10 years from now than they are today.

Mfr. 3: You asked about equipment, fuel, and ways of doing business. On equipment, I look for new materials like plastics and glass to be so

widely used in home design that the house can be built to take advantage of automatically-controlled light, heat, and sound. There'll be movable walls, controlled polaroid windows, and controlled venetian blinds to utilize natural forces as an aid to home comfort.

There's also a trend away from central cooling units and portable, room-to-room heat pump may be in use by 1965. Electricity should be the basic fuel for heating by that time. The price will be lower because of the increased summer cooling load. Of course, it

will be a long time before gas goes out as a major fuel because of the big investment in pipe lines.

On ways of doing business, we must continue to seek out dealers who are in sound financial condition and willing to aggressively promote their products. Those who stay in the field should devote themselves exclusively to residential heating and cooling products. And, if we manufacturers expect any support from the trade, we must do a better job of providing merchandising and training help.

Mfr. 4: Cooling may be necessary in the south in 1965 but I see no realistic need for it in the northern states. It will be 10 years before atomic power is a significant factor

in residential heating and cooling. This means equipment and fuels will be about like they are today.

Int.: How about changes in the way you conduct your business?

Mfr. 4: We insist on local responsibility for heating and cooling jobs and we'll continue to give intensive training to local dealers.

Mfr. 5: Now, I don't see much change in fuel in the next 10 years. Atomic power won't be cheap enough. We are a small company. Sure, we're concerned about these mergers but we think there'll be a place for us if we stay on the ball. We'll have to keep on depending on the dealers we've been associated with down through the years

and we are going to keep on supporting them. Because of the way some of the big companies have treated the dealers in the past, we believe many will insist on doing business with the small manufacturer.

Mfr. 6: We're starting to sell directly to the home builder, bypassing the wholesaler. It's the only way we can introduce new equipment to our expanding markets. By 1965 this equipment may include heat pumps with supplemental heat provided by strip heaters in the ductwork.

Of course, we still have some problems to be worked out before we build any of these units. The dealer who sells them for us 10 years

(Continued on next page)

Smartest promotion in —AND YOU'RE THE STAR!



wants to show you how easy
it is to give your family
year-round AIR CONDITIONING

Worthington Climate Man strips mystery from
air conditioning with unique "see-it-yourself!"
demonstration in your own home

No matter what you've read—or heard—about home air conditioning, it's no substitute for a Worthington CLIMATE MAN's unusual home demonstration.

This man can actually show you what your air-conditioned home will be like. Think of being able to beat off terrific summer temperatures...keep humidity at a comfortable, healthful level...shut out unhealthy dirt, pollen and dust. This is the pleasant picture your Worthington CLIMATE MAN will present for you.

In full-color transparencies—easy to look at—you'll see the Worthington

CLIMATE ENGINEERS
TO INDUSTRY, BUSINESS
AND THE HOME

WORTHINGTON



Air conditioning without water is something the public has never seen before. Here's the first time ever that Worthington's new "see-it-yourself" demonstration has been made available to the public.

Businesses as well as homes can call on the C. J. Morris Company and contractors like Morris to demonstrate the Worthington Climate Man's unique "see-it-yourself" demonstration. And it proves Worthington can supply the most complete air conditioning for every home.

as
seen
in...

The Saturday Evening
POST

Here's how 4½ million Saturday Evening Post families will meet the Worthington CLIMATE MAN on March 17, 1956. That's when Worthington's 1956 consumer campaign kicks off with a big POST spread announcing air conditioning's unique home demonstration designed to help you sell. Full-scale campaigns in POST, HOUSE AND GARDEN, BUSINESS WEEK, HOUSE AND HOME and leading trade publications carry this potent story straight to your prospects in all fields.

(Continued from preceding page)

from now may be one of the present types who has added household appliances to his present line or he may be an appliance dealer who has extended his products to include heating and air conditioning.

Int.: How about mergers?

Mfr. 6: I wouldn't be surprised to see some mergers among regional companies like ours to give nationwide coverage.

Int.: We've heard a lot of talk about mergers in the industry. Would you comment on this trend, sir?

Mfr. 7: We all have heard a lot of merger talk, of course. Speaking for my own company, I can tell you that we will not—under any circumstances—merge with other manufacturers. Rather, we are adopting a more aggressive attitude in sales promotion and plan to do every-

thing possible to compete with the larger firms.

Mfr. 8: The heating industry is badly behind the times. What we need are some leaders—sort of a Big Three like they have in the automobile industry. We also need some dealers who haven't gone soft. They've been the backbone of our industry for years but now it seems they aren't in there fighting, arguing, and selling. They've reverted to price instead of salesmanship as their principal method of operation.

Of course, so have many of the manufacturers.

Int.: What about the future?

Mfr. 8: Many of these companies will go down for the count.

Mfr. 9: If the new developments are produced—heat pumps, heating-cooling panels, electric power and atomic generating plants—the small

manufacturer will be out of business. In fact, we may get out of the business ourselves before long.

Mfr. 10: 1965 will mark the end of the residential heating business as we know it today. Many manufacturers will either have merged with larger companies or will be out of business. There are over 140 companies manufacturing year-round air conditioning today. By 1965 there will be no more than 25. This will be good for the industry.

Int.: For those that survive, what do you see in the way of fuel and equipment?

Mfr. 10: Gas and electricity will both be important if the gas industry gets behind forced warm air. But they've got to get together and do a positive job of promoting heating and cooling. So far as equipment is concerned, four leading manufacturers

have developed almost all of the forward reaching cooling equipment including experimental work on chilled water cooling. The others have all copied them.

Leading manufacturers have for some time developed equipment that could be supplied as a package, requiring

less specialization by the trade. This kind of development can do a lot to correct situations like the one where two dealers quoted on two houses that were just alike . . . and one quoted at \$1,300 while the other quoted at \$2,700 for the very same kind of installation.

Dealers Look to Mfrs. for Something New In Coming 10 Years, Wilson Says

Dealers charged with the major responsibility for selling, installing, and servicing heating and air conditioning equipment are also looking to manufacturers "for something new in the next decade," Wilson asserted.

Once again the market researchers recorded statements, this time by individual dealers.

Dealer 1: Big problem for us is how to do a professional job and still compete in the

light of the severe price cutting.

Dealer 2: Biggest sore spot in the industry today and one that will become more serious in the future is the type of competitive bidding on jobs which really means indiscriminate price slashing.

Dealer 3: Conscientious dealers are handicapped by the back-alley operators who successfully under-bid them with a second-rate job.

Dealer 4: I see a mess for our business unless we make it legitimate—more than a wildcat business. There are too many who don't know what a B.t.u. is or what to do with it.

Dealer 5: We can't make any money servicing air conditioning. There are too many special gadgets. We need standardization of components like we have for heating.

Wilson broke in to state that the greatest number of calls on dealers followed this pattern. Most are so absorbed in present-day problems they have little time or inclination to think about 10 years from now, he said. "They do not appear will-

ing or able to take responsibility for the future."

In fact, many dealers are "looking to someone else to solve their problems." And much the same is true of wholesalers, Wilson continued. A few are looking ahead—more are not.

"Too often we hear mention of mass production as a means of reducing the cost of residential cooling units, but little or nothing about how to get the American people to spend money for residential cooling instead of for kitchens, color television, or cars," he emphasized.

(Concluded on next page)

air conditioning history

Unique, new way to demonstrate Worthington's complete line casts you as the CLIMATE MAN

Here's the sales idea you've been waiting for!

Worthington's demonstration kit gives you the easiest-to-tell, easiest-to-sell air conditioning story of the year. It makes you the Worthington CLIMATE MAN—makes you an air conditioning expert, equipped to carry your story right into any prospect's home, office or store . . . and tell it in a way no competitive dealer can match.

HOW THE NEW DEMONSTRATION SELLS

In full-color transparencies you'll show prospects exactly how their Worthington air conditioner will look . . . how it will fit into their home or store.

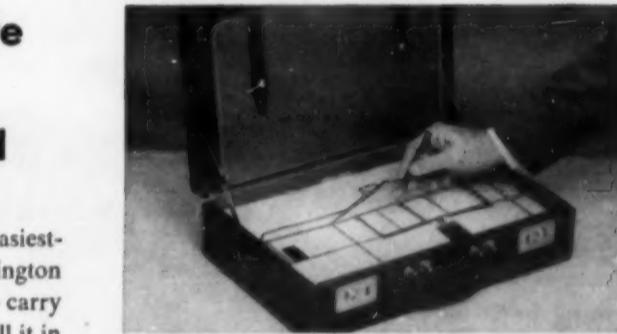
Actual parts of the unit—like coils and filters—demonstrate the quality and operation of Worthington equipment. And the Climate Kit helps you blueprint your prospect's specific installation . . . work out cost and payment figures right before his eyes.

PROMOTIONAL PIECES BACK YOU UP

The smartest, hardest selling ad campaign we've ever run (see left page) is only part of the story. You get interest-building TV and radio spots, newspaper mats, billboards and car cards, merchandising displays, mailing pieces and sales literature too. They all tell your prospects that the one man best equipped to give them the straight facts about air conditioning is their Worthington CLIMATE MAN. That's you!

COMPLETE LINE MORE VERSATILE THAN EVER

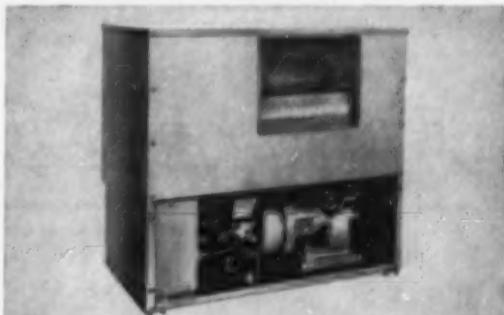
This year Worthington tops the industry with the smartest idea in air conditioning—the remarkable space-saving FLEXI-COOL unit that fits anywhere. With Worthington units to fit every application—and smart, compact styling a feature of every unit—you've got the finest, most versatile line as well as the smartest promotion in the industry. Call your Worthington District Representative today. Then, revise your sales forecasts upwards and go to work. Worthington Corporation and Refrigeration Division, Section A.6.20-AC, Harrison, N. J.



NEW KIT HELPS YOU show each prospect his own custom-made Worthington installation. Your quick sketch shows him where and how his Worthington unit will work best.



FLEXI-COOL SECTIONAL AIR CONDITIONING. Fit sections together as a unit or install them separately anywhere. Saves stocking space for you.



WORTHINGTON AIR-COOLED UNITS. Air conditioning without water is another Worthington extra. Perfect for water-short areas.



EVERYBODY WILL BE LOOKING FOR THIS SEAL



when protected with



MECHANICAL INDUSTRIES
PRODUCTION COMPANY
223 ASH STREET • AKRON, OHIO

THE BEST FRANCHISE...
THE MOST COMPLETE LINE



For more information about products advertised on this page use Information Center, page 26.

Consumers Disagree on Home Comfort But Expect Progress, Survey Shows

(Concluded from preceding page)

Our interviewers, Wilson stated, talked to hundreds of people all over the nation to get the consumers' opinion on this subject. In this tape recording of their answers, which I will play, sex of the responder is given before the reply.

Interviewer: Madam, do you think your home will be heated differently in 1965?

Woman 1: Well, I don't know much about heating. I suppose we'll have something better by then.

Int.: How about air conditioning?

Woman 1: If they get the cost down, I'd say 95% of the homes will be air conditioned.

Man 1: I think we'll see a trend to hot air heating and away from hot water. I've

heard about this heat pump, too.

Man 2: Maybe I'll have an atomic furnace or electricity for heating from atomic energy.

Woman 2: We don't need much heat—only need it a few days of the year. But air conditioning sure is wonderful. It gives us just what we need.

Woman 3: I don't like air conditioning. It doesn't condition the air right. It's downright unhealthy.

Man 3: I'll have air conditioning and central heating, too, because it'll be a lot easier to have both in the same system.

Man 4: Our steam heating system is all right. I don't know too much about heating, anyway.

Man 5: I think we'll have "are representative of the many something new, don't know what it will be though."

Man 6: I don't know about this atom bomb thing for heating—I think it's farther away than 1965.

Man 7: I look for someone to invent something that will take the heat out of the earth in winter and cooling out of the earth in summer.

Man 8: You can't tell about modern science, maybe we'll have atomic heating. I'd sure like air conditioning though.

Woman 4: Air conditioning is too expensive. They've got to get the cost down.

Man 9: If it was up to my wife, I'd have air conditioning now.

Man 10: Air conditioning? Don't need it.

Man 11: They have air conditioning where I work and I think I'll have it in the house when I can afford it.

"Those," Wilson interjected,

One Else' is YOU—the equipment manufacturer.

"The public is looking to you for something new, although it isn't quite sure what it is."

"The dealer is looking to you not only for new comfort generating equipment as someone called it, but for help and guidance on improved methods of merchandising, marketing, and servicing. So is the wholesaler," he emphasized.

"And finally, the home builder and the architect are looking to you for imaginative engineering and developments that will permit them to offer the public better and more comfortable homes."

Wilson expressed confidence that the manufacturers would exploit to the limit of their resources and abilities opportunities which lie ahead.

First of these, he asserted, is in the field of both gas and electric year-round air conditioning, together with improved air purification and cleaning methods.

Second, he went on, is the long-range one offered by solar, atomic, and electric heating, and possibly cooling as well.

The big question he asked: "Can you individually, develop and exploit these tremendous opportunities fast enough to broaden the scope, importance, and profits of your industry and be ready for 1965?"

Stating that recently emphasis has been on cost reduction through improved manufacturing techniques and high volume tooling to produce the "most efficient and simple" heat generator possible, Wilson believes there has been too little effort spent on proper utilization of this in the home.

It isn't going to be easy, he thinks, to shift that emphasis. "By this I mean making heating important to the homeowner by new developments, by better installations, by improved merchandising methods, and more effective advertising and promotion."

Wilson predicted that about 1965 a housing boom will come along "much larger than any we've seen before." Babies born immediately following World War II will then be establishing homes of their own.

Having grown up in the "first phase" of a home comfort revolution which produced a leisurely and comfortable way of life, these homeowners "will demand more comfort" than those of today.

Moral: "More will be expected of the comfort generating industry," he averred. Public attitude probably will be more favorable then.

To foster this potential comfort environment, he concluded, the heating and cooling industry has the assets—and it has the opportunities.

ALUMINUM

What are you doing with weight-saving aluminum? Using it now—or considering its use? Either way, it's sound advice to make Wolverine your first source for plain or finned tubing, tubular-shaped parts or extruded shapes.

Wolverine has grown with the refrigeration industry—knows your needs—has a complete product line available in many sizes and popular alloys. For example, whether you use copper or aluminum tube for liquid and suction lines, evaporator and condenser coils—count on Wolverine Tubemanship. Depend upon Wolverine's unique Spun End Process* for the inexpensive, speedy production of one-piece accumulators, accumulator driers, driers and strainers.

Trim and shelf supports are natural applications, for Wolverine extruded aluminum shapes.

Make Wolverine your first source for light-weight economical aluminum. In addition, of course, remember Wolverine is famous for copper refrigeration tube. Write now for our aluminum catalog.

Wolverine Tube, 1413 Central Ave., Detroit 9, Mich.

* A PATENTED PROCESS RE. 23485



WOLVERINE TUBE

Division of Calumet & Hecla, Inc.

MANUFACTURERS OF QUALITY CONTROLLED TUBING AND EXTRUDED ALUMINUM SHAPES

PLANTS IN DETROIT, MICHIGAN, AND DECATUR, ALABAMA. SALES OFFICES IN PRINCIPAL CITIES

EXPORT DEPARTMENT, 13 EAST 40TH STREET, NEW YORK 10, NEW YORK

COMING 
in your mail...Free Record

* Watch for it! Hear Sat. Friday of Dragnet fame give the plain facts about the revolutionary new air conditioning development by Lennox.

SEE THE LENNOX

AD ON PAGES 14-15



It's great to be a Carrier Dealer with the new Carrier *International* Room Air Conditioner to sell!

It's a well-built beauty!

Engineered by the people who beat the heat from Bombay to Brazil to Boston. Pleasing to the eye, quiet to the ear, designed to deliver years of hot weather comfort.

It's priced for profits!

Never more competitive! The best price ever on a Carrier Room Air Conditioner—with the quality features you would expect to find in a unit built by the people who air condition the world.

It's got some dandy deals!

Like the 6-5-4 deal (still a secret but we'll tell you about it in person). The most liberal financing plan in the business. Plus the "Strive for Five" salesman incentive plan.

It's promoted to the hilt!

The new "mystery box," a free precision instrument to help you sell more air conditioners. Eye-catching, traffic-building room unit displays for your floor. Exciting, colorful point-of-sale material.

And, brother, is it advertised!

Two big producers join your sales force (no commissions to pay). Dave Garroway of NBC-TV's "Today" show and Arlene Francis of NBC-TV's "Home" show will direct prospects to your store. So will a booming volume of national magazine advertising.

What's it all add up to?

This: if you like the musical sounds of busy cash registers and the sight of dollars pouring in

"IT'S TIME TO CALL CARRIER"

Carrier

first name in air conditioning

Sizing Ducts

3 Factors Include Plenum Pressure, Air Quantity, Total Effective Duct Length, Waalkes Advises

ATLANTIC CITY, N. J.—Caution should be exercised in using simplified tables to determine duct sizes, Robert J. Waalkes, products engineer for Hart & Cooley Mfg. Co., warned service-men attending the 18th annual convention of the Refrigeration Service Engineers Society here recently.

"Unless the conditions that you find on the job are similar to those assumed by the table, you will be a long way off on your sizes," Waalkes advised. "It is better not to use a simplified table if conditions are not as assumed."

Two Approaches

After outlining for the engineers some of the factors involved in duct sizing and construction, Waalkes noted two approaches now being used to design duct systems for both heating and cooling, where larger ducts are required for cooling than heating.

One approach, he said is to design the system so that the heating load will more nearly match the cooling load. This can be done by introducing cooler air to the unit during winter, thus increasing the heating load.

Another approach used by some manufacturers is to build resistance into the air conditioning unit. The blower is sized to handle the cooling load. But when the unit is switched to heating, it will meet more resistance, thus cutting down on air velocity.

Three Basic Factors

Waalkes explained that there are three basic factors involved in sizing ducts.

First factor is the pressure available at the plenum of the air conditioning unit. This depends on the design of the unit or it can be arbitrarily selected.

Second factor is the quantity of air to be handled. This depends on the heat gain of the room, the temperature of the supply air, and the size of the cooling coil.

Waalkes noted that the temperature of the supply air is dependent on the temperature of the air off the coil, the ambient temperature, the duct insulation, duct velocity, and duct size.

Third factor is the total effective length of the duct. This depends on the actual length of the duct plus the equivalent length of the fittings.

Actual duct length, he said, depends on the location of the room outlets, the location of the cooling unit, the type of duct distribution system used, and the building construction.

Equivalent length of fittings varies according to the number of fittings used, the type and design of the fittings, the velocity of the air through them, and their size.

A poorly designed fitting gives greater friction loss than necessary, while the smaller the fitting the less the friction loss, he said.

On the cooling cycle, he said,

the temperature rise in the duct varies as to the actual length of the duct and not its effective length.

Waalkes emphasized two points for designers of air conditioning systems to remember.

One is not to blow the air on people. The other is to get good air distribution throughout the space to be conditioned.

"In many ways, perimeter distribution is easier to use than high wall distribution," he declared. "The air can't blow on people if you fan it up the wall."

In the construction of ducts, he advised, try to keep the interiors as smooth as possible

and keep the joints as tight as possible. The same applies to the fittings. Insulate the duct when it passes through an unconditioned space, for the better the insulation, the less the temperature rise in the air it carries. And be sure to use a vapor barrier.

Asked where one should put the return air duct in a combined heating and cooling system—in the ceiling or the floor, Waalkes declared that it doesn't matter too much if the velocity of air over the grille is not too high.

Smoke tests show, he said, that high or low placement is not as critical as proper sizing.

Lewyt Sees 75% of Homes and Offices Air Conditioned During Next 5 Years

CLEVELAND—About 75% of the nation's homes and offices will be air conditioned during the next five years, a New York industrialist told a group of builders, architects, and engineers attending an air conditioning conference sponsored here by Cleveland Electric Illuminating Co.

He said that about 50% of today's new structures have air conditioning, or provisions for air conditioning installations in the near future. He pointed out that his own company has sold more than 25,000 built-in wall units in less than six months in the New York City market.

He declared that surveys among his company's new distributors indicate "a definite trend for all new buildings to include air conditioning, while older structures are being modernized with various cooling systems."

The president of Lewyt Air Conditioner Corp., Brooklyn, ing systems."

Just the facts, Mr. Dealer,
ON A
REVOLUTIONARY
air conditioning
development...

Watch for
Your Record!

You'll soon receive in the mail a phonograph record from Sgt. Friday relating the plain facts on an air conditioning opportunity you can't afford to pass up!

EXPECT

something different... for it IS! And it's far superior to anything else in the entire air conditioning field!

EXPECT

greater sales... because this is the new idea in air conditioning that multiplies your prospects—every day!

EXPECT

more in the way of profits... for you'll be amazed at the low cost, the easy installation, the terrific opportunities this new development brings you.

Hurry!

Play the record to get the Profit Facts.
Then write your nearest Lennox branch for more information. No obligation, of course.

LENNOX Industries Inc.

Established 1895

Illinois ASHAE Hears How Cork, Rubber, Steel Springs Help Isolate Air Conditioning, Ventilating Vibration

CHICAGO—The problem of noise control for air conditioning and ventilating systems was the subject of the December meeting of the Illinois Chapter of the American Society of Heating and Air Conditioning Engineers.

Defining the need for better methods of isolating vibration at its source, Norman J. Mason, chief engineer, Vibration Mountings, Inc., said,

"During the past years there has been an increasing need for improved isolation methods in the air conditioning industry. This has been a natural phenomenon as air conditioning systems have become more extensive and building construction lighter."

"The capacity of both fans and compressors has been increased in direct proportion to these larger systems. Because of rising costs, the units have been made smaller and so they must run at higher speeds."

"While it is true that balancing techniques have been improved, the vibratory forces vary as the square of the velocity for a given unbalance at a constant radius. Therefore, we have problems today that did not exist 20 years ago with slow speed compressors and large heavy, slow speed fans."

"There are three principal isolation materials used by the vibration control industry today and various combinations of these three basic materials. The

materials are cork, rubber, or synthetic rubber and steel springs."

"Cork is one of the earliest isolation materials used. While its static deflection would indicate good results at high frequencies, it is one of those materials that do not have natural frequencies that correspond to the deflection."

"Rubber pads are produced in various forms that allow the incompressible material to shear, bulge, or do both to encourage deflection."

"Generally speaking, single pads are capable of 0.09 in. of static deflection. But better results can be obtained by stacking the pads and the total deflection used as a basis for an

isolation efficiency calculation."

"When spring mountings are used in the air conditioning industry, it is important that the construction does not increase the horizontal noise frequencies by the introduction of stiff snubbers."

Speaking on the advisability of selecting a control for noise for a specific application, James J. Hughes, general manager, Industrial Sound Control, Inc., advised the engineers to select the size noise reducing device specified in a catalog rather than to attempt to incorporate safety features on their own.

Hughes pointed out that the type of noise developed, for example, by a blower for a ventilation system is usually of two types, high and low frequency.

The vibration control is designed to handle a certain volume of low frequency noise plus a specified absorption of high frequency noise.

If, in the attempt to place a safety feature in the installation, the engineer specifies a larger vibration control, the ratio of high frequency to low frequency noise would be upset, often with the result that certain types of noises would be more noticeable than if the smaller—but correct—vibration control was used.

Hughes also outlined six methods that can be used to reduce noise in duct systems created by air movement. He noted and explained the use of each of the following methods:

- 1) lined duct;
- 2) splitters;
- 3) egg crate;
- 4) lined plenum;
- 5) lined turns;
- 6) prefabricated noise trap.

McQuay Names Close To Sales Position

MINNEAPOLIS—H. Blake Thomas, executive vice president in charge of sales of McQuay, Inc., announces the appointment of Alvin R. Close as the heating and air conditioning representative in the Toledo territory.

A. R. Close
Close has been a manufacturers' representative for allied lines since 1952, and prior to that time he was a research engineer with Battelle Memorial Institute and Owen-Illinois Glass Co.

He is a graduate of the University of Toledo and a charter member of the Toledo Chapter of ASHAE.

Drayer-Hanson Appoints Secord Sales Engineer

LOS ANGELES—Appointment of Irving Secord as sales engineer, Commercial Div., Drayer-Hanson, Inc., is announced by Fred E. Schmuck, the firm's national sales manager.

Before joining Drayer-Hanson, the new sales engineer was most recently associated with Tucker & Sons, San Gabriel, Calif., installer and distributor of air conditioning equipment.

Before transferring west, he manned a sales engineering post for Griffith Consumers Co., Washington, D. C. for a six-year period. Griffith is area distributor for Worthington products in the District of Columbia, Maryland, and Virginia.

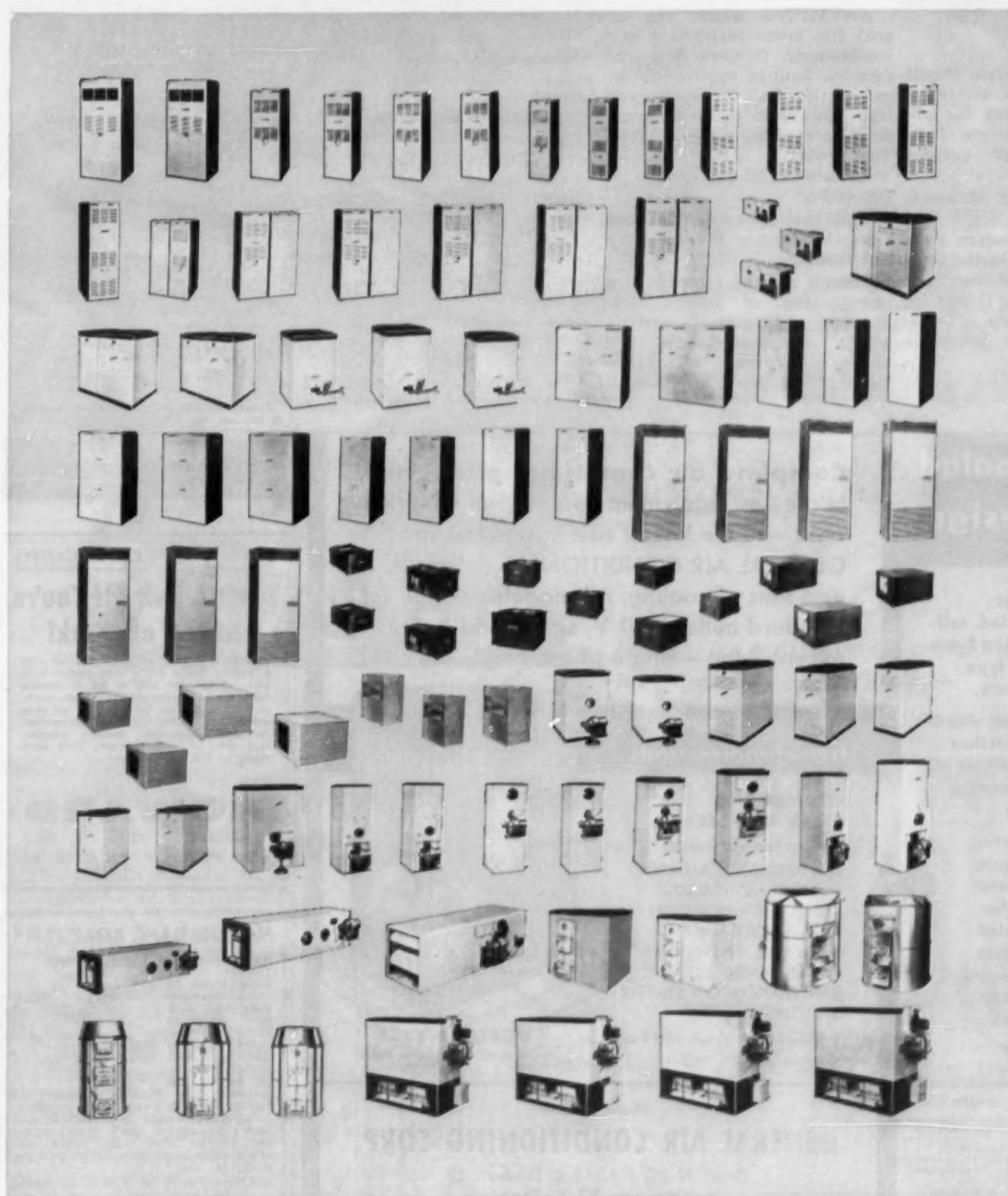
Ingersoll Elects Gombert to Post

KALAMAZOO, Mich.—J. H. Ingersoll, president of Ingersoll Conditioned Air Div. of Borg-Warner Corp., has announced the election of Fred S. Gombert as a divisional vice president.

Gombert is manager of the Conditioned Air Div. with plant and offices in Kalamazoo.

Prior to joining Borg-Warner in 1954, Gombert was sales manager of Hall Neal Furnace Co. of Indianapolis. He was also affiliated with the Heating Controls Div. of Minneapolis-Honeywell Regulator Co. and has been associated with the heating industry for the past 15 years.

LENNOX...absolutely the most complete line of air conditioning and heating equipment



MARSHALLTOWN, IOWA • COLUMBUS, OHIO • SYRACUSE, N.Y. • FORT WORTH, TEXAS
SALT LAKE CITY, UTAH • LOS ANGELES, CALIF. • DECATUR, GA. • DES MOINES, IOWA
In Canada: Toronto, Montreal and Calgary

For more information about products advertised on this page use Information Center, page 26.

Inside Dope

By GEORGE F. TAUBENECK

(Concluded from Page 1, Col. 1)

aids, parlor games, etc. This conglomerate business has shot up 800% in the last six years;

(3) Fancy automobiles, sports cars; spruced-up houses; pleasure farms; travel trailers; boats of all sorts (outboard motors have enjoyed an astoundingly upward sales graph);

(4) Home tools and equipment, such as mechanized grass mowers—up from 100,000 to 2,600,000 in less than eight years.

Although professional economists haven't caught up with this trend yet, we predict that soon they will be studying and measuring formally:

THE LEISURE FACTOR IN ECONOMIC PROGRESS.

Eventually some double-dome professor will formulate this new law of economics:

Leisure breeds consumption (buying things to use in spare time).

Currently the recreational market comprises an ultra-billion-dollar business which didn't exist a few years ago. Last year \$11 billion was spent for travel; 8,000,000 new cars were bought; and 6,000,000 families now own water vehicles of one kind or another. Take golf—this market defies belief. In the 1930s there was not one specialty golf shop in existence. Today there are more than 8,000.

Comparable commercialized LEISURE phenomena include high-fidelity music, underwater fishing gear, and stylized clothes for every hobby.

For more than 200 years American men needed only two sets of attire; overalls and a Sunday suit. In the latter, if

they didn't go to church often grandfathers did in 1900, at today's rate of productivity we'd have 40% more products, and 20 less unoccupied hours per week to enjoy them. Nowadays we're setting sales records for fishing licenses, house paint, gardening tools, gasoline, art supplies, phonograph records, and extravagant vacations, as a result of this greater productivity—and the time to enjoy pleasures!

Add to those bonanzas outdoor grilles, canasta and scrabble, Arthur Murray dance classes, Dale Carnegie speaking and personality lessons, and you get an inkling of the burgeoning market for leisure spending.

Obviously it's a "new world" for buyers who no longer worry about saving for a rainy day. Reasons they don't: pension plans, Social Security, and unbounded optimism as to the future.

Take automobiles. Henry Ford's 1925 formula: "They can have any color they want so long as it's black." Thirty years later Chrysler President Tex Colbert off-handed: "With more leisure, people feel younger—so we give the old lady more color and the old man more horsepower."

Doesn't that sum up the situation succinctly?

Male vs. Female

Two seemingly diverse trends can be noted in this movement toward economic uses for leisure:

(a) "Do-it-yourself" hobbies for men;

(b) "Do-it-for-me" demands by women.

Shorter working hours have brought men home. During their extra time at home they are making and repairing things for their families. This "Do-It-Yourself" craze has become a gold mine in itself.

If we worked as long as our

dustrial age can be ameliorized by Ma's emancipation from drudgery, and Pa's extra time with the kids.

That Time Factor isn't an inelastic family boon, however. It will stretch only until the children are off to the races—their own. After the kids have shaken off parental guidance, what then for Ma and Pa? Freed parents either will vegetate, luxuriate, or justify their earthly existence by doing something somehow to improve the world of today and tomorrow.

More than humane instincts and willingness will be required for this latter task. Creativeness is the *sine qua non* of that job. We need social inventions to match the scientific "breakthroughs" of electronics and atomics.

Social Inventions

We must insure that leisure becomes *productive*, rather than *seductive*. Let's see to it that men are encouraged to *think* in their extra time, instead of running around vainly seeking pleasure. Let's provide outlets in advance for their footloose energies.

Instead of just killing time, leisured men should strive to erase human ills.

How can they do that? *Adult education*—organized and directed toward creative thinking about human problems—is a good answer. All over the world there are countless human problems, from eradicating sickness to insuring peace, which deserve thoughtful mental concentration. What a challenge!

The Greek word for "leisure" is the origin of our word for "school." The Greeks thought of leisure as the opportunity for moral and intellectual development and participation in the life of the community.

We are an inventive, creative

people. With time on our hands (to use, not to kill) we can better the lot of mankind amazingly. How? By devoting a substantial portion of our enlarged leisure to constructive THINKING.

While a few will stash away dollars by supplying rapidly increasing millions of people with attractive tools for loafing and pleasure, thoughtful folk will convert spare time rewardingly into the service of humanity-at-large.

At the Roman Empire's peak, her citizens enjoyed almost TOTAL leisure. They misused that boon for sensual gratification. Rome fell.

That could happen to us, but we doubt that it will. We Americans are generous, and we admire unselfishness.

If our tremendous creative energies are channelled into productive community, national, and international undertakings, our children and grandchildren will lead wondrous lives.

Perfection Promotes 2

CLEVELAND—Promotion of W. F. Leuszler to sales manager of the appliance division and W. B. Gathings to distribution and administrative manager of Perfection Industries, Inc. was announced by Donald G. Wright, general sales manager.



Aspir-Jet, the new spray nozzle, increases efficiency of cooling towers by increasing water break-up and improving water distribution. This is accomplished by the Aspir-Jet unique design which atomizes the water with as little as one-half pound nozzle pressure. Formed of butylate plastic, Aspir-Jets last longer because they do not corrode. Thousands in use are giving better cooling even with lower than normal pressures.

* Available through Refrigeration and Air Conditioning Wholesalers.

Manufacturers & Refrigeration Wholesalers: If you are not now using or stocking this outstanding new product, wire or write

THERMAL AGENCY
National Sales Agents
1515 DALLAS • HOUSTON, TEXAS

MANUFACTURER'S REPRESENTATIVES

Don't Answer If You're Afraid of Work!

But, if you think you can keep up with a factory that's got a new product-and-plan picture for 1956 so big it requires ADDITIONAL representation in all states, and if you like big earnings and can show you're now calling on the refrigeration, restaurant equipment, baker's supplies, food plan or bottler's trade, then we're ready to talk to you now!

write, wire or call . . .

HOWARD
REFRIGERATOR COMPANY, INC.
4745 WORTH ST., PHILA. 24, PA.

MOTOR BASE ADAPTERS Sell Many Other Items

Keep them in stock. Servicemen will pick up adapters and motors, carry them in their cars, and complete service on the job in one call. Eliminates delay of having motors away for rebuilding. Adapters are easy to install, fit any base. No motor shaft too long or too short. They also bring you more sales in motors, belts, pulleys, controls, etc.

SIZES FOR 1/2 to 3 H.P. Inclusive
Engineering Research Associates, Inc.
3475 East Nine-Mile Road
Hazel Park, Michigan

New compactness in air-cooled AIR CONDITIONER design!



Smallest air-cooled, self-contained 5-ton central type unit made.

5 natural wood-grain finishes available on all free-standing models.

Completely automatic, thermostat controlled, air-cooled condenser. (Water-cooled available on 5-ton).

MODEL RO-575W
(with air distribution head)

Complete air conditioning for entire home—or equivalent commercial or office area—at the lowest cost in smallest space!

GENERAL AIR CONDITIONERS deliver 2, 3 or 5 tons of cooling. All models operate on standard outlet (220 V, single and 3 phase except 2-ton—single phase only).

Attic, roof, outside, or free-standing units

NATIONWIDE SALES AND SERVICE

Offices and warehouses:
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CLEVELAND • HOUSTON
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NASHVILLE • NEW YORK
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SAN FRANCISCO • SEATTLE
ST. LOUIS • TAMPA

WRITE today for details. Franchise dealerships available.



MODEL RO-525A
(without air distribution head)

Main Office

GENERAL AIR CONDITIONING CORP.

Dept. N-20 • 4542 E. Dunham St.
Los Angeles 23, California

FIVE YEAR GUARANTEE—easy payment plan

R 3
Refrigeration Division - Curtis Manufacturing Company - St. Louis, Mo.

NOW

profit comes in **colors**

DUSTY PINK FRENCH GRAY FIRNMIST COLONY BLUE SANDALWOOD POTTERY BLUE

as shown in illustration

a completely **NEW**
sales appeal in

Curtis
AIR CONDITIONING
UNITS

It's a Curtis exclusive!

For the first time Curtis packaged
air conditioning units in a rainbow of
cool restful colors baked on at the factory.

Dealers everywhere will welcome
this sales plus because:

1. The modern trend is to colors in
appliances of all kinds. Now you have it in
Curtis packaged air-conditioning.
2. Combinations of colors are available
to complement any decorative pattern your
customer may desire!
3. A whole new field is opened to you with these
new colorful Curtis units that cool and add beauty
to any interior.

Remember,
you can
count
on

and ONLY Curtis has it!

Curtis

MANUFACTURING COMPANY
Refrigeration Division

1912 KIENLEN AVE. • ST. LOUIS 20, MO.

CURTIS PACKAGED AIR CONDITIONING UNITS—SPECIFICATIONS

CABINET

Constructed of heavy gauge steel with an attractive baked finish that can be furnished in various color combinations as selected by customer.

HUMIDITY CONTROL

All units are furnished with a by-pass damper.

INSULATION

The interior is entirely insulated with approved type of heavy insulating and sound-absorbing material. This prevents exterior sweating and insures quietness.

COMPRESSOR—COMPRESSOR MOTOR

Hermetic and semi-hermetic type for F-22.

CONDENSER—RECEIVER

Shell and coil type with Lo-Fin copper tubes. Extra large capacity, low pressure drop, for either city water or cooling tower. A.S.M.E. condenser (with liquid level gauge assembly connections) standard. A fusible safety union standard on all models.

MAGNETIC MOTOR STARTER

Across-the-line magnetic motor starter provided with thermal overload protection.

FILTERS

Standard throw-a-way type.

COOLING COIL

Properly sized, balanced with the condensing unit. Copper tube and aluminum fin construction, mechanically and thermally bonded for highest heat transfer. Tubes are staggered and headered for maximum efficiency.

CONTROL

An automatic thermostat and a three position selector switch is built into the unit and is adjustable from the exterior of the cabinet. The fan may be operated separately for ventilation when cooling is not required. High pressure cutout-control is regular equipment. (Cutout pressure for F-22 is 350 PSI.) Note: On Model Series 15 & 20, selector switch controls No. 1 compressor; thermostat controls No. 2 compressor.

SEE YOUR CURTIS REPRESENTATIVE

OR

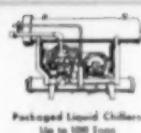
WRITE



Condensing Units
Up to 100 Tons



Cooling Towers
Up to 100 Tons



Packaged Liquid Chillers
Up to 100 Tons



Multi-Zone Air Handling Units
Up to 75 Tons



Condensing Units Air Cooled
Commercial Residential

OPTIONAL EQUIPMENT

The following is available when specified.

PLENUM AND GRILLE ASSEMBLY

When duct work is not necessary the plenum and grille assembly is available as an extra. The discharge grille is adjustable in two directions.

WATER REGULATING VALVE

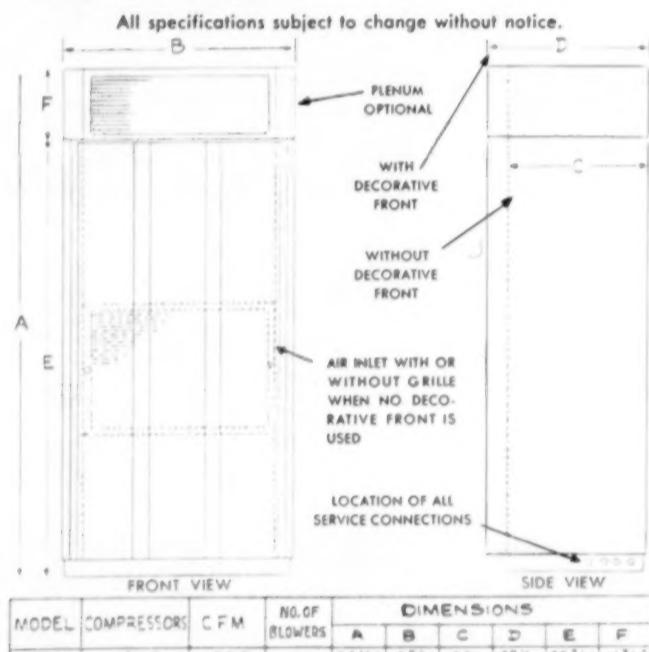
For use with city water supply. Valve is not attached.

HEATING COIL

When specified, one or two row heating coil, hot water, steam, or steam distributing tube type can be provided for field installation.

COOLING COIL

For special applications, additional rows can be furnished, when heating coil is not used.



MODEL	COMPRESSORS	CFM	NO. OF BLOWERS	DIMENSIONS				
				A	B	C	D	E
CA400	1-3 HP	1200	1	64 1/2	25	22	25 1/2	72 3/4
CA600	1-5 HP	2000	1	84 1/2	38	24	27 1/2	72 3/4
CA800	1-7 1/2 HP	3000	2	93 3/4	42	24	27 1/2	80
CA1200	1-10 HP	4000	2	98 1/4	54	24	27 1/2	85
CA1600	2-7 1/2 HP	6000	3	98 3/4	78	25	28 1/2	85
CA2200	2-10 HP	8000	3	107 3/4	78	30	33 1/2	92

Standard air discharge is vertical-up on all units, only on model CA2200 top horizontal air discharge (front or rear) optional with standard parts.

102 YEARS
OF MANUFACTURING
EXPERIENCE

MANUFACTURING CO.
Refrigeration Division
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Long Term Research Seen Vital To Assure Adequate Water

NEW YORK CITY—Greater use of air conditioning units was one of the reasons given by an expert for the increasingly serious water shortage in ten northeastern states, according to a recent news item here.

Dr. William Frederick of Chicago, research director of the Council of State Governments, speaking before a two-day conference on the subject, declared that causes of problems in water conservation and distribution include industrial growth and increased use of air conditioning equipment, washing machines, and plumbing.

He estimated that in 25 years "our per capita use of water will be double what it is now."

Dr. Frederick believes there is an urgent need for long-term research into water resources with the view of obtaining legislation in the various states for conservation and effective distribution of the supply.

New Firm Succeeds A. R. Tiller Corp. In Richmond, Va.

RICHMOND, Va.—Incorporation of Air Conditioning Suppliers, Inc. to succeed A. R. Tiller Corp. in the refrigeration and air conditioning wholesale parts business was reported recently.

This move followed the death of A. R. Tiller and the subsequent purchase of A. R. Tiller Corp. by Mr. Tiller's former partner.

The new company is made up of four former employees of the Tiller corporation, with a total of more than 30 years' service with that firm.

Officers of the new concern are Garland B. Alexander, 36, president; Lacy Ellis Early, 37, vice president; James Richard Henshaw, 34, treasurer; Rice M. Youell, Jr., secretary; and Robert H. Keim, general manager.

Alexander has had over eight years' experience in the wholesale business, first as sales engineer, then manager of refrigeration sales, and most recently vice president of A. R. Tiller Corp. Prior to joining Tiller, he was sales engineer for Catlett-Johnson Corp., Virginia air conditioning and refrigeration contractor.

He has graduated from factory schools at Carrier Corp., York Institute, and served in the Navy as instructor in refrigeration and air conditioning.

Early has had over seven years' experience in the wholesale business, first in counter sales and later as field sales representative for the refrigeration and air conditioning department. Before joining Tiller, he worked with both Frigidaire and York dealers as a service engineer.

Henshaw has had more than four years' experience in the refrigeration wholesale business, working in counter sales for Tiller. Earlier, he was service engineer for a local distributor of refrigeration equipment.

Detroit NAPRE Prepares To Host '56 National Convention

DETROIT—Entire slate of officers in the Detroit chapter of the National Association of Practical Refrigerating Engineers was re-elected for 1956.

The move was made to keep experienced men at the helm during preparations for the national N.A.P.R.E. convention scheduled for Detroit in Nov.

President of the chapter and convention co-chairman is Charles M. Heemstra of Com-

Hall Manages Contract Div. at Utility Appliance

LOS ANGELES—Ben B. Breslow, president of Utility Appliance Corp., has announced the appointment of John L. Hall as manager of the company's new Contract Div. to handle construction, builder, and architect sales, effective Nov. 1, 1955.

Hall has worked 25 years with the Southern California Gas Co.

Breslow, also president of Mission Appliance Corp., further announced that Hall will

include Mission products in his new sales operation, as well as the Gaffers & Sattler automatic gas range division of Utility Appliance Corp.

A. O. Smith Elects Cornell

MILWAUKEE—F. S. Cornell has been elected executive vice president and a director of A. O. Smith Corp. Cornell succeeded Anthony von Wening on the board of directors.

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ACCURATE TEMPERATURE
CONTROL... INSTALL

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CONTROLS FOR
EVERY COOLER
APPLICATION

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Designers and Manufacturers of Thermostatic Expansion Valves; Evaporator Pressure Regulators; Solenoid Valves; Float Valves; Float Switches.

ALCO VALVE CO.
853 KINGSLAND AVE. • ST. LOUIS 5, MO.

6786

Merchandise Mart To Host Second Talkfest At Chicago Mart, Jan. 15

CHICAGO—The Merchandise Mart will host a second all-day "bull session" for appliance dealers during the International Home Furnishings Market in January.

The meeting, sponsored in cooperation with the National Appliance & Radio-TV Dealers Association, will be held Sunday, Jan. 15, in the Merchants and Manufacturers Club in The Mart, beginning at 10:00 a.m.

Following the pattern established at last June's successful first-time Merchandise Mart appliance "bull session," there will be morning and afternoon audience participation panel discussions, chairmanned by outstanding appliance dealers of the country.

Morning discussions will be on "How Well Do You Handle Yourself?" chairmanned by Don Gabbert, Gabbert's, Minneapolis, NARDA vice president, and "How To Find and Hire Profit-Producing Salesmen," led by Morris I. Pickus, president of Personnel Institute, New York City.

Sol Polk, president of Polk Bros., Chicago, will be the featured speaker at the luncheon meeting scheduled for the "bull session" program.

Afternoon sessions will be on "Trade-Ins," led by George Johnston, Johnston's, Minneapolis; "Costs of Doing Business," chairmanned by NARDA economic consultant Richard E. Snyder; and "Profitable Promotions," led by Robert C. Justis, Justis Bros., Newport, Del.

Following the final session, The Merchandise Mart will entertain those in attendance at a cocktail party.

Gibson Retains Honn To Coordinate Eqpt. With Home Design

GREENVILLE, Mich.—Gibson Refrigerator Co. has retained an architectural consultant, Donald A. Honn, A.I.A., to coordinate the development of its equipment with modern home design, it was announced recently by J. L. Johnson, vice president and general manager of the Gibson Div.

Honn, who for the past seven years has headed his own architectural firm in Tulsa, Okla., was previously connected with Skidmore, Owings & Merrill, Chicago, and with Ganster & Hennighausen, Waukegan, Ill.

His recent work has included the designing of several large office and commercial buildings, but he is best known for his contributions to important housing projects in the Southwest.

Johnson said Gibson has retained an architect of Honn's stature because the refrigerators, freezers, ranges, and air conditioning and heating equipment used in the home are no longer merely accessories or luxuries but have become an essential and integral part of modern living.

"Designing this equipment therefore becomes a function of the architect as well as the engineer," he said.

Servel Ups Laine to Sales Service Mgr.

EVANSVILLE, Ind.—Jerry Laine, a 25-year employee at Servel, Inc., has been promoted to manager of the company's sales service department, it was announced by Richard S. Testut, vice president and general manager of the home appliance sales division.

Laine will be responsible for supervising and coordinating non-technical services to Servel users, dealers, and distributors. He succeeds Emil Nensel who has been appointed sales manager of Servel's Philadelphia district.

Prior to this promotion, Laine was director of the customer service section in the company's appliance service department. He started at Servel in 1930 as a production control analyst.

Next Refrigerator for 3.7 Million Home Freezer Owners To Have Under 30-Lb. Frozen Food Capacity, One Study Shows

CHICAGO—The next refrigerator for approximately 3,700,000 home freezer owners will have a frozen food chest with less than 30 lbs. of capacity, Norge Div., Borg-Warner Corp., reported recently.

And every year, if 8 to 10-year replacement holds true, this group will provide 370,000 potential customers for appliance dealers.

These were the main findings of a survey of home freezer owners revealed by the consumer research department of Norge.

More than 50% of freezer owners use the refrigerator frozen food compartment only for quick "in-out" storage. Even basement location of the freezer

did not influence the usage of the freezer chest in the refrigerator, the report showed.

R. C. Connell, Norge vice president of sales, said the study showed a trend that is not being exploited by refrigerator manufacturers. There is overemphasis on combination refrigerator-freezers at the expense of the potential customer for a refrigerator only.

He said one result of the survey was the addition to the 1956 Norge line of a refrigerator with no freezer space other than an ice cube compartment. The model (C6-12) is the "Food-Stor" and carries a suggested list price of \$369.95.

"Some 28% of homemakers indicated that the next refrig-

erator they buy will be one without a frozen food compartment of any kind," he said.

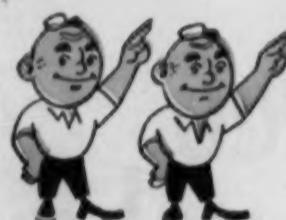
"An additional 27% preferred a compartment of less than 30 lbs. capacity."

The survey showed that more than half the homemakers use the frozen food compartment in their present refrigerators primarily for "temporary" or "convenience" type storage such as frozen juices, ice cream, and ice cubes. From a usage standpoint, about half of the freezer owners would be satisfied with a frozen food compartment of approximately 20 lbs. capacity.

Still another finding was that location of the freezer had no bearing upon the intended size of the frozen food compartment.



Cold shelves of wire and dependable Bundyweld Tubing provide ample contact-freezing area for large upright home freezers made by leading manufacturer. Coils of dependable Bundyweld are also used in condenser; parts made of Bundyweld are used in compressor unit.



Behind the reliability of freezer cold shelves— Bundyweld Tubing

WHY BUNDYWELD IS BETTER TUBING



Bundyweld starts as a single strip of copper-coated steel. Then it's . . .



continuously rolled twice around laterally into a tube of uniform thickness, and



passed through a furnace. Copper coating fuses with steel. Result . . .



SIZES UP TO 1 1/2 O.D.



SIZES UP TO 5/8" O.D.

NOTE the exclusive Bundy-developed beveled edges, which afford a smoother joint, absence of bead, and less chance for any leakage.

Amana Reports Retail Freezer Sales Hit All-Time High During October

AMANA, Iowa—Retail sales of Amana freezers reached an all-time high during the month of October, it was reported.

Twenty-five per cent more warranty cards, "the surest barometer of retail sales," were received from freezer purchasers in October this year than in October, 1954, it was announced by J. A. Rishel, general sales manager of Amana Refrigeration, Inc.

This October, 1955 figure was 3% greater than the previous highest retail sales month, August, 1955, and marked the first time in Amana history that October led in retail selling of freezers. August is a traditional peak selling month.

Amana freezer sales to dis-

tributors in the first ten months of 1955 were 30.4% ahead of the same period in 1954, he said. Freezer sales by the entire industry showed an 8% increase, according to Rishel.

Consumer preference for large size uprights was reaffirmed during the ten-month period, Rishel said, with 82% of freezer deliveries having a 15-cu. ft. capacity and larger. Most popular size has been the 15-cu. ft. size, with the 19-cu. ft. model running a close second.

During the year freezer sales by all classes of the company's dealers, including appliance stores, department stores, locker plants, and furniture and hardware stores, have been advanc-

ing, it was stated.

Hotpoint Announces '56 Freezer Details

CHICAGO—Four food freezers—two chest models and two uprights—have been introduced by Hotpoint Co. for 1956.

The 12-cu. ft. upright (6FM-12) is capable of freezing 417 lbs. of frozen foods at zero temperatures and the 18 cu. ft. (6FM-18) is capable of freezing 630 lbs. of frozen foods, it was noted.

Two chest types offered include the 17-cu. ft. 6FK-17 capable of freezing 595 lbs. of frozen foods and the 26-cu. ft. 6FK-26 capable of freezing 903 lbs. of frozen foods. The 26-cu. ft. model is a two-door unit.

One feature of the 12 and 18-cu. ft. upright models is the freezer door juice dispenser, which holds 25 cans of juice concentrate. It loads on top and

unloads from the bottom, "assuring that first cans purchased are the first cans used."

"Another feature of these two models," Hotpoint said, "is double freezing protection. Freezing coils are in the shelves as well as the walls, permitting even all-round freezing."

Automatic temperature control is provided on both upright models. This control is adjustable from 0° to -10°. Large storage baskets for bulky frozen food items are located at the bottom of the freezer and there is one adjustable removable shelf permitting additional storage space.

Two chest-type freezers have fast freezing compartments which are refrigerated on three sides and the bottom. New sliding baskets simplify food storage. Vertical wire separators divide space into sections.

An automatic temperature

control is provided. Cake and pie racks store pastry and pies on two shelves.

All 1956 freezers are Capri color styled with interior lights.

Suggested retail prices of the 12 and 18-cu. ft. uprights are \$399.95 and \$549.95, respectively. The chest models carry prices of \$479.95 and \$659.95.

Formula Offered To Determine Freezer Owner's Need

CINCINNATI—In determining whether or not his freezer-food plan customer's eyes are bigger than his freezer, Y. W. Locke allows about \$11 per cu. ft. for a chest type freezer and \$10 per cu. ft. for an upright on food orders.

Locke, who operates Florida Frozen Products, Inc. of Tampa, told freezer-food plan operators at the National Frozen Food Locker Institute convention here recently some of the precautions he takes to assure that food is safely delivered.

He delivers food orders within an 88-mile radius of Tampa. The frozen food is packed in insulated bags and delivered in non-refrigerated or insulated trucks. He claims this method has proved successful, even with ice cream. Ice cream is placed in the center of the bag, surrounded by other frozen foods.

Under this system, Locke noted, it is important to have someone at the customer's home to accept the order when it arrives. To assure that there will be someone to receive the order, Locke calls the customer in advance to tell him the shipment is coming.

On reaching the customer's home, Locke insists that the delivery boy check the order with the customer and stack the food in the freezer for him. The delivery boy is also instructed to see that the freezer door or lid will close properly after the freezer has been filled. If there is too much food, the customer is advised to take care of the excess in some other way.

Locke estimated that dollar-wise, food orders divide into 50% beef, 23% miscellaneous meats, 9% poultry, 9% vegetables, 3% seafoods, 2% fruits, 1½% concentrates, and 2½% other foods or specialties.

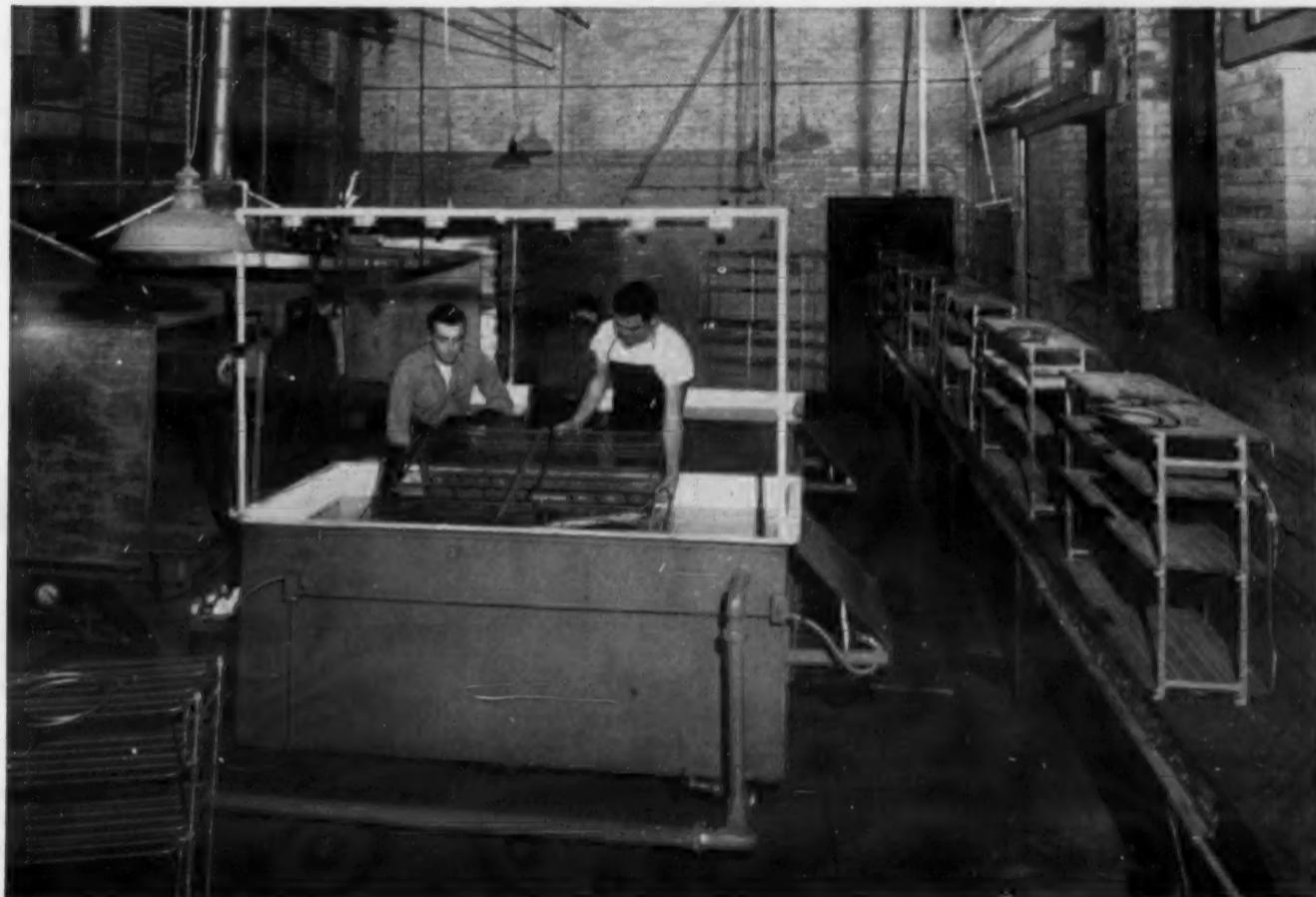
Grand Opening Proves To Be Big Day for Mrs. Hollingsworth

CHATTANOOGA, Tenn.—Dropping in at the grand opening of Dunagan Appliance Co.'s Broad St. store here, Mrs. Ola Hollingsworth and her son, Ralph, partook of free coffee and cake and made a guess at the number of beans in a jug.

They listened intently while Salesman Ralph Edwards showed them the Frigidaire appliance line. A few minutes later they signed an order for a refrigerator, washer, dryer, and water heater. And they paid cash.

The pair had taken a taxi to the store, but the delighted Edwards personally chauffeured them home.

When the bean guessing contest was over, who should win a wide oven Frigidaire range? Of course, Mrs. Hollingsworth!



Workmen in a typical freezer assembly plant run routine leakage test on cold-shelf unit made of Bundyweld. Result: As expected, no leakage. Bundyweld is absolutely leakproof; gives no evidence of leakage in presence of halogen leak detector, sensitive to leaks as small as 1/100 ounce a year.

Manufacturers of today's reliable home freezers are naturally concerned with maintaining leak-free, trouble-free performance for their products. That's why so many of them depend on extra-strong Bundyweld Steel Tubing for vital evaporators, condensers, compressors, refrigerant lines, other tubing parts.

It's no accident that Bundyweld is the safety standard of the refrigeration industry; rather, it's a matter of inherent tubing quality. Bundyweld is leakproof; thinner walled, yet stronger; has high thermal conductivity; takes easily to standard coatings.

Bundy backs up its fine tubing with unexcelled fabrication facilities. For example, we will economically produce long serpentine coils (see above); inspect them; clean them thoroughly; ship them on schedule, clean and bright, ready for use. In fact, we can supply you with any type of coil your operation requires; or, if you do your own fabricating, we'll ship Bundyweld to you in clean, straight lengths.

For more details on Bundyweld and Bundy's expert engineering and fabrication services, call, write or wire us.

BUNDY TUBING COMPANY • DETROIT 14, MICHIGAN

BUNDYWELD TUBING®

DOUBLE-WALLED FROM A SINGLE STRIP

Bundy Tubing Distributors and Representatives: Cambridge 42, Mass.: Austin-Hastings Co., Inc., 226 Bonney St. • Chattanooga 2, Tenn.: Pearson-Deakin Co., 823-824 Chattanooga Bank Bldg. • Chicago 32, Ill.: Lapham-Hickey Co., 3333 W. 47th Place • Elizabeth, New Jersey: A. B. Murray Co., Inc., Post Office Box 476 • Los Angeles 58, Calif.: Tubesales, 5400 Alton Ave. • Philadelphia 3, Penn.: Rutan & Co., 1717 Sansom St. • San Francisco 10, Calif.: Pacific Metals Co., Ltd., 3100 19th St. • Seattle 4, Wash.: Eagle Metals Co., 4755 First Ave., South Toronto 5, Ontario, Canada: Alloy Metal Sales, Ltd., 181 Fleet St., E. • Bundyweld nickel and Monel tubing are sold by distributors of nickel and nickel alloys in principal cities.

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"I have always felt that whatever the Divine Providence permitted to occur I was not too proud to report. The people are not served by pussyfooting, or by that sort of journalism in which nobody will ask who is the editor of a paper or the writer of an article, and nobody will care."—Charles A. Dana.

**OFF THE CHEST**

Inland Mfg. Div.
General Motors Corp.
Dayton 1, Ohio

Editor:

Your book of stories has already helped me gain a reputation as a raconteur, and your other books will make both a better citizen and a better salesman.

J. F. O'BRIEN,
Sales Division

Roy Clapper's Lincoln Tire & Appliance Co.
216 S. Kickapoo St.
Lincoln, Ill.

Editor:

Your article in the Dec. 5, 1955, NEWS was right on the target as far as time and interest are concerned. However, I differ with you as to the outcome.

My difference is predicated on two factors:

Number One: The farm income has decreased 25% since 1951. Hundreds of implement dealers have gone out of business in the last year. Those still in business are stocked with new tractors, combines, and other implements beyond the peak of their credit limits. In our county, we have come from 16 implement dealers down to nine and five of the nine left are on a C.O.D. basis. The automobile dealers are in a similar position.

Number Two: Our distribution system is very sick. Either manufacturers must go into every hamlet and crossroads with factory service on appli-

ances, autos, implements, etc., or go back to selling and protecting the sales and service type of dealer.

Discount houses and wholesale catalogs can't and won't service and stock parts. Neither can they sell new ideas without outside salesmen and demonstrators.

Think back about the outside salesman who talked prospects into trying mechanical refrigeration over the old ice box, the salesmen who persuaded people to ride in the gas buggies, and trade off the horse and buggy, the salesman who got farmers to try rubber on their tractors in place of steel wheels. These are a few of the new ideas that had to be sold, demonstrated, and serviced. When your sales and service type of dealer is extinct, how are the manufacturers going to sell new ways of living? In order to keep our industrial spiral high, we must have new ideas and products.

Who's going to sell, service, and demonstrate them? A few people have found out that if you buy a \$500 refrigerator for \$300 and three weeks later the cold control goes bad, and they can't get a serviceman or the new part quickly, that the \$300 was wasted because the refrigerator won't perform the service it was purchased to do. Therefore, it's junk in the customer's eyes. Manufacturers have been too interested in material and labor. I'm afraid they may wake up too late. Watch out for 1957. 1956 is election year and they are forced to hold it high.

ROY CLAPPER

They'll
Do It
Every
Time

by
Jimmy
Hatlo



What Do Freezer Owners Think of Them?

How does the home freezer stand the test of time? After five years or more of use, how does it impress the freezer owner? Has it proved to be worth the investment? Has the owner's opinion of freezers and food freezing changed over that time? Does he have any suggestions for improvements?

Answers to these and other questions on freezer use have been provided by the Cornell School of Nutrition (based on a survey, of course).

Though opinions varied on many questions, all owners agreed that they were delighted with their freezers. Unanimously they agreed that the freezer had paid its way either in added convenience or in money saved. If they were to buy another freezer, most would choose the same brand that they now have.

While many reported that they had saved money through seasonal and quantity buying, and by utilizing food that would otherwise have been wasted, a majority affirmed that convenience was the biggest benefit derived from the freezer. Personal satisfaction, savings in time and labor, more interesting meals, and better year-round eating were other benefits mentioned.

In fact, 57% of the freezer owners said that if they were selling freezers they would base their promotion on the convenience factor. Only 18% would stress the money savings angle. And just one family thought the good looks of a freezer was a selling point.

Asked to suggest improvements, owners mentioned many of the accessories and changes already incorporated in modern

freezers. Improvements cited are automatic defrosting, drains for easier manual defrosting, less depth in chest models, and lower prices. Service on their freezers was required by 53% of the families, mostly on motors. Fans, thermostats, and thermometers were other trouble spots. Most of the service was covered by the manufacturer's guarantee. Of those calls not so covered, costs ranged from \$10 to \$120 (for replacement of a motor out of warranty).

Quite a lot of the surveyed families declared that their freezers were too small. Half of these had freezers of less than 8-cu. ft. capacity. The freezer should be either in, or close to, the kitchen, it was agreed. Nearly half of those surveyed kept their boxes in the basement.

When it came to freezing foods, the surveyed families used their freezers mostly for meats; thereafter for vegetables, fruits, baked goods, and pre-cooked foods, in that order. Most families used factory-supplied instruction booklets to guide them in preparing food for the freezer. They were satisfied with the directions given and found them adequate.

Forty-three per cent of the families surveyed revealed that they were freezing raw foodstuffs less and less. Reasons given included the reduction or elimination of gardens, fewer mouths to feed, lower prices for pre-frozen foodstuffs, lack of time for freezing, and sheer laziness.

Increasing commercial presentation of frozen baked goods and commercially frozen complete dinners were applauded happily by all home freezer owners and users.

Handy Way to Subscribe

To See the Industry In Action EVERY WEEK

Keep up-to-date on what's going on in your industry. You'll see action weekly in AIR CONDITIONING & REFRIGERATION NEWS. Covers latest news and gives you top how-to-do-it reports on commercial and residential air conditioning, commercial and home refrigeration: manufacturing, contracting, distributing, retailing, and servicing. Read the Industry's newspaper for profit every week. Only \$6.00 per year, 52 issues.

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G-E Adds Employees at Louisville To Meet Refrigerator Demand

LOUISVILLE, Ky.—General Electric Co. announced recently that about 2,000 new employees will be hired at Appliance Park during January and February, increasing total employment at the Park to around 14,500 and the annual payroll to approximately \$62,600,000.

About half of the new workers will be employed in the plant's household refrigerator department, which will start manufacturing food freezers here in January. The freezers have been produced at G-E's plant in Erie, Pa.

In addition, current demand for refrigerators is outstripping production capacity, requiring the hiring of more workers, ac-

cording to the company.

The rest of the new workers will be employed by the home laundry, range, and dishwasher and "Disposall" departments. G-E said production of each of these appliances "is running at a record level and it is expected to increase even further in early 1956."

The 2,000 new employees are in addition to the 900 the company previously announced it would hire when the manufacture of room air conditioners begins in a new building at Appliance Park.

Quicfrez Appoints Tye

FOND DU LAC, Wis.—John J. Tye has been named merchandising manager for Quicfrez, Inc., manufacturer of refrigerators and home freezers.

Tye was formerly sales manager for Kiekhafel Corp., and with Sears, Roebuck & Co. in merchandising assignments.

Modernization Plans To Be Detailed Feb. 23-24 At Wiring Conference

NEW YORK CITY—Detailed analyses of two highly successful wiring modernization programs will highlight each of the morning sessions at the 12th Annual National Adequate Wiring Conference to be held in Chicago at the LaSalle hotel on Feb. 23-24.

Other features will include a review of "What Makes People Buy Wiring" based on a motivation survey made for the National Electrical Contractors Association; a panel discussion of wiring standards of the future; presentation of the *Look* magazine trophies for outstanding adequate wiring promotional activity; the distributor's role in the adequate wiring program;

how a specialty salesman sells wiring modernization.

Of special interest will be a coordinated presentation of all adequate wiring advertising and promotional programs which will be conducted at the national level during 1956 by the National Adequate Wiring Bureau, The Edison Electric Institute, The National Electrical Contractors' Association, individual NEMA members, and others.

Requests should be sent to the reservation manager, LaSalle hotel, Chicago 2, Ill.

Bendix Ups Dryer Prices

CINCINNATI—Increases of \$20 and \$30 in the suggested list prices of two Bendix clothes dryers were announced recently.

The models are DFE-D and DFF-D, now priced at \$229.95 and \$249.95, respectively. Increased costs of materials and labor made the raise necessary.

Kelvinator Names Hill to New Post

DETROIT—Ross W. Hill, former Kelvinator regional representative, has been named manager of used appliances, according to J. M. Tenney, manager of retail marketing.

He will assist Kelvinator dealers in the "Verified Value" program and Leonard dealers in the "Better Buy" program for reconditioning and reselling of trade-in appliances.

Starting as a retail appliance salesman, Hill's appliance background covers more than 26 years. He joined Kelvinator's Kansas City zone in 1940 in charge of promotion and sales of electric ranges. For two years he was manager of the Des Moines, Iowa branch office and in 1946 he was named regional representative.



MILLIONS OF FEET of aluminum refrigeration tubing produced every month by

Bohn is one of the country's largest producers of seamless aluminum tubing. Equally important, Bohn bulk tubing is the same uniform, high-quality product that goes into Bohn evaporators—used and proven in hundreds of thousands of refrigerators and freezers.

EVAPORATORS • FREEZER PLATES • TUBING • REFRIGERATION COILS

BOHN ALUMINUM AND BRASS CORPORATION

1400 LAFAYETTE BUILDING DETROIT 26, MICHIGAN

Sales Offices: • BOSTON • CHICAGO • CLEVELAND • DAYTON • DETROIT
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BOHN



BOHN'S FLASH-BUTT WELDING of copper to aluminum tubing is the most positive method of making connectors.

For more information about products advertised on this page use Information Center, page 26.

Leasing Store Equipment Advantageous to Dealer with Low Working Capital, But No Cure-All, NCRSA Hears

ATLANTIC CITY, N. J.—Leasing of store equipment is not a cure-all for deferred payment problems, nor does it mean any tax-saving, according to Ray Winther, San Francisco commercial distributor.

But it can be an advantage to a business low on working capital, Winther told the National Commercial Refrigerator Sales Association at its ninth annual convention here recently.

Winther Analyzes Leasing

Winther's approach was "to analyze leasing as an aid to sales," he explained.

"After a few years of selling as a professional salesman in our industry I have come to the realization that there is one and ourselves; first as a salesman

only one way to increase profits, and secondly as a firm," he said. "That is to increase sales," cautioned.

"When I say increase sales I do not mean to just increase volume for the sake of establishing sales records or hearing the dollars jingle, but I think along with the professional salesman who believes that the only worthwhile sale is a profitable sale.

"To be a profitable sale it must have not only a proper price tag, which enables the firm and the salesman to enjoy a return for their effort and knowledge, but it must also be

a profitable deal for the buyer, because unless the purchase is a benefit to him we have hurt

only one way to increase profits, and secondly as a firm," he said. "That is to increase sales," cautioned.

Refrigeration Industry

Late Entrant In Leasing

"We hear of leasing in all industries, and ours is probably one of the last to get into it on a substantial scale, even though I am personally aware of equipment leasing in our industry in food stores as long as 20 years ago.

"Automobiles are being leased very successfully; the railroad cars in which some of us arrived at this meeting are being leased; and in addition, buildings, properties, and equipment of all kinds and descriptions, even prefabricated school houses are

now being leased by progressive school districts.

"Leasing, to some people, has been just another way of extending terms of payment on the procurement of equipment, and their term 'lease' has been a subterfuge for a conditional sales contract.

"The lessor, or in many cases, the buyer, has been lulled into a false position by accepting a 'lease' with an option to buy and at the same time led to believe that the deal carries with it the advantages of leasing," said Winther.

"Leasing as such is not a cure-all, and contrary to most thinking, there is no tax saving connected with leasing. This may come as a surprise to some

of you, and we'll come back later and discuss it.

"To understand the advantage of leasing we must go into the financing behind it.

"In a broad sense leasing is generally advantageous to a business low on working capital, and we happen to be doing business in such an industry—food stores—where working capital is being used or turned more rapidly than in most industries, and when you boil business down to the core, it is the working capital that enables us to make a profit and it is the lack of working capital that keeps us from expanding.

Explains What Working Capital Is

"What is working capital? It is liquid assets or money. It is the difference between your current assets, money and saleable inventory, and your current liabilities, those bills that must be paid now in order to maintain our credit," he explained.

"Many businesses have wrecked themselves by converting their cash into fixed assets such as equipment and real property, neither of which is satisfactory or acceptable for the payment of bills.

"It is the working capital which enables a firm to do business and to expand, and it has been reliably estimated that the average company earns a minimum of 40% return annually on working capital, if handled properly.

"Therefore, unless a business is blessed with an over-abundance of working capital it could well investigate the leasing of equipment for the same reason many firms have leased real property. Real estate leases, however, have been made for years and a standard practice has been developed to make such leases good for all involved.

"The leasing of equipment has not reached such a level and many leases written have been far from true and honest. In fact, some leases have been licenses to steal on the part of the lessor; and others have amounted to selling your soul or giving up the freedom of management, as exemplified by equipment leases from or through certain food suppliers," Winther declared.

Many Legitimate Leasing Companies

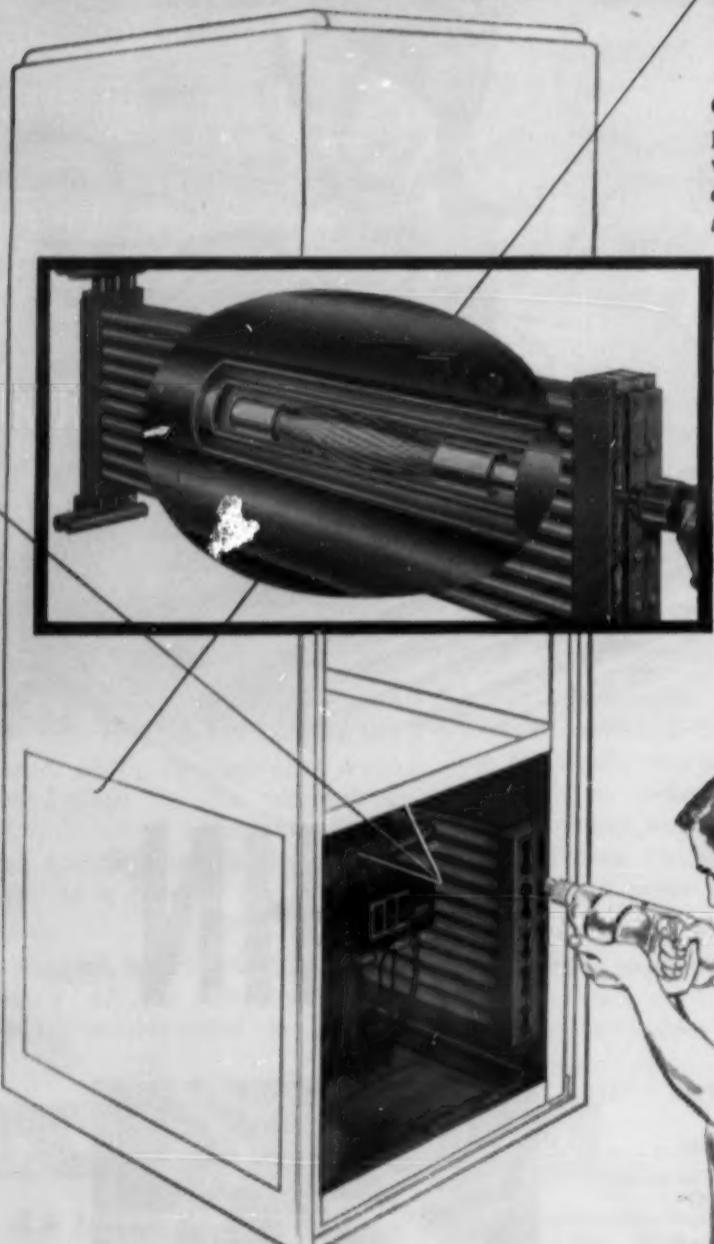
"However, there are many legitimate leasing companies who are out to make a profit, for sure, but at the same time they give the lessor or customer a true, honest lease. This means that the cost to the user has to include interest on principal plus depreciation over the duration of the lease, which, in most instances, is a lesser period than the life of the equipment.

"At the end of the initial lease period the equipment rental usually drops to only a fraction of the original rental, and here again it benefits both parties to the deal: the annual fixed cost is lower to the user, and the owner is finally coming into a small clear profit.

"Let us take a simple example: A job involving \$50,000 is in question. If the buyer pays cash he reduces his working capital by \$50,000; thereby losing at least \$20,000 potential

(Concluded on next page)

we protect the warranty because... this Condenser is CLEANABLE



Opening a hermetically-sealed system to replace plugged condensers means voiding the warranty. But Halstead & Mitchell condensers are CLEANABLE without breaking into the refrigeration system.

CLEANABLE Condensers eliminate the danger of opening the sealed system to moisture and dirt . . . mean no expensive scrapping of the old condenser. Your serviceman, using a simple cleaning tool, can restore air conditioning or refrigeration condensers to new-unit efficiency in a matter of minutes. Meanwhile the hermetically-sealed refrigerant remains clean and dry.

Most manufacturers now insist on Halstead & Mitchell CLEANABLE Condensers. You'll find it economically sound to do the same!

½ thru 25 tons



HALSTEAD & MITCHELL IS THE WORLD'S LARGEST MANUFACTURER OF DOUBLE-TUBE COUNTERFLOW CLEANABLE CONDENSERS

HM
Halstead & Mitchell

BESSEMER BUILDING • PITTSBURGH 22, PA.

For more information about products advertised on this page use Information Center, page 26.

Store Equipment Leasing--

(Concluded from preceding page) earnings, based on 40% return on working capital. On the other hand he must pay out probably \$13,000 in rental for interest and straight line depreciation.

"The income of \$20,000 on the use of the money should remain constant while the rental payments usually decrease because of interest on the decreasing balance. In any event, the use of the money is worth \$7,000 more per year plus the added value or income from the use of the new equipment," he said.

"Now we'll get back to my previous statement that there is no tax saving in leasing. What you do in leasing is pay depreciation as you go, while in buying equipment you actually pre-pay depreciation. Whether you own or lease, eventually 100% of the cost will come out as depreciation. The only difference is WHEN."

7 Years Depreciation Prepaid by Cash

"If you pay cash for the equipment, \$50,000, you pre-pay seven years depreciation, based on a seven-year life of our equipment, and the time element used by buyers varies greatly for different reasons. Some corporations who must of necessity satisfy stockholders use a 10-year life. Individuals, I know, have used five years, but an acceptable average is seven," Winther indicated.

"If the same equipment were purchased on a conventional three-year contract, at an extremely low contract interest, the payments would be \$18,600, more or less, per year, while depreciation or expensing would be only \$12,500 the first year; \$10,700 the second year, and \$9,000 the third year, or a total of \$32,200 after three years using the sum of the digits method.

"The difference, or a total of approximately \$18,000, would have to be prepaid from earnings after taxes," he said.

"On the other hand, a proper lease would give the lessor full use of the same equipment at an annual rental of about \$11,750, all of which would be expensed currently.

"The lessor with good credit could purchase his equipment in some instances for the same terms, and after five years he would be fully paid, but \$5,400 of his payments would still be pre-paid depreciation and not expensed out.

Other Approaches To Leasing

"There are other approaches to leasing. One such approach is a real quick way to expense out a new piece of equipment, maybe. This plan was actually offered to a company I know.

"The equipment in question sold for \$6,000, payable \$2,000 on delivery and two annual payments of \$2,000. Title is retained by the lessor. After three years, the rental is 2½% per year or \$150 per year. If the user wants to buy, and this is not in the contract, but a side agreement, he may obtain title after three years by paying 4½% per annum interest on the \$6,000 for the time elapsed.

"This 'lease' is perfectly

proper for the lessor, because he can depreciate it for the duration of the lease, but the user might be questioned on this method of expensing rental. This method is used quite extensively in road building where a single job may run over a period of several years, and where equipment leasing has become an established practice, but it is a bit different in our industry," Winther commented.

"Other commercial leasing operators will take good credits on payment schedules of all varying interest rates from 6% contract to less than 6% simple.

"These plans require a pre-paid rental of about six months, the first month and the last five months, or about 12½% to 15% deposit. The interest is charged in some instances on the face of the contract and the schedule of

payments is so arranged that the lessor gets back all of his money in less than three years. This type of leasing is profitable, but the profit goes to the lessor company.

Equipment Used as Security Is Problem

"One problem of leasing equipment in our industry is that many of our buyers use equipment, or their equity in the equipment, as security for their building lease. Most market buildings are one-purpose buildings and the owner usually demands a substantial security either in cash or in the form of a first claim on the equipment to insure himself against business interruption in his property," Winther said.

"Cash being at a premium, many of our customers pledge the equipment, so unless an account has credit or reputation enough to secure properties

without excessive lease security he must use the equipment, and if he does, leasing will not work because title is retained by the lessor, leaving nothing tangible for the user to put up as security.

Leasing Workable Only For Those Who Don't Need Special Terms

"Leasing, therefore, is workable only for operators who do not need special terms. As far as we can see it, leasing cannot be used as an excuse for more lenient or longer terms. Each customer and each job must be analyzed individually. Leasing must be avoided on jobs where it would have an excessive cost to the customer, and it can be used to great advantage where the credit is such that a penalty is not attached to its use.

"It then becomes our own problem to determine whether leasing can 'increase profits.' If

used unwisely it will certainly increase volume and with it contingent liability, some of which will definitely go bad; but if used wisely and cautiously it will increase sales from our good credit customers, and with those good sales we can definitely increase our profits," Winther believes.

Servel Names Wall

EVANSVILLE, Ind.—John H. Wall has been appointed executive vice president of Servel, Inc., according to Duncan C. Menzies, company president.

For the past year, Wall has been vice president and general manager of Servel's home appliance division. In his new position he will also be responsible for a number of related functions, including appliance sales, contract sales, product development, engineering, employee relations, quality control, plant maintenance, and procurement.

for '56

FREEZ-KING ANNOUNCES

the greatest development in modern continuous freezers!

the new FREEZ-KING—easiest to operate and most sanitary twin freezer in the world. Two complete freezers in one stand—each unit operates independently—every portion perfect—exclusive new FREEZ-KING automatic feed.

MODEL 975
SELF CONTAINED

Spigot type draw-off produces neat, uniform products. All stainless steel. Large output capacity.

MODEL 160 SHAKE DISPENSER
serves
200 SHAKES AN HOUR

- Easy! As simple as serving a soft drink.
- Produces shakes and malts at low cost—high speed—big profits.
- Sanitary! Direct from dispenser to customer. No handling. No contamination.

MODEL 150
serves
SOFT ICE CREAM or FROZEN CUSTARD

- Uses less power—costs less to operate.
- Requires only four square feet of floor space.
- Easy to clean! Takes only 5 to 10 minutes instead of the usual ½ to 1½ hours.

2 LOW PRICED MODELS FOR

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Drive-Ins	Drug Stores	Military Canteens
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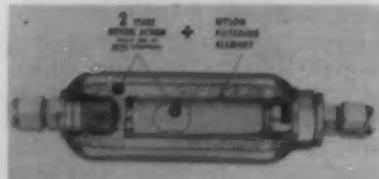
... and many others

EXCLUSIVE TERRITORIES AVAILABLE FOR MASTER DISTRIBUTORS & DEALERS

WRITE FOR DETAILS THE FREEZ-KING CORPORATION

2518 WEST MONTROSE AVE., DEPT. 30, CHICAGO 18, ILL.

What's New



2-Stage Drying Action Filter-Drier Offered

—KEY NO. F-120—

CHICAGO—New "Golden Torpedo" filter-driers, with two-stage drying action, have been announced by The Imperial Brass Mfg. Co. here.

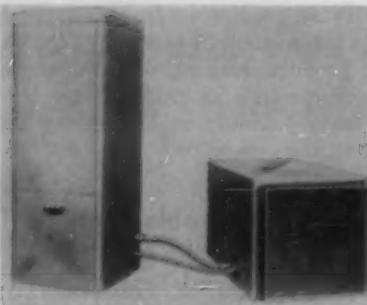
The new unit has two desiccant chambers within the shell and a new "Impernyl" filter made of nylon. The new design is claimed to provide exceptional drying and filtering capacity in a very compact unit.

"The refrigerant passes through a monel finger screen into the main desiccant chamber," the company claims.

"It then passes through a new nylon cloth filter into a second desiccant chamber within the filter," it was stated.

"Because the refrigerant enters the second chamber cleanly filtered, the secondary desiccant performs at 100% efficiency, giving exceptionally effective and sustained drying action," the company said.

The new filter-drier is supplied charged with PA-400 high capacity silica gel. It is of copper and brass construction with end fittings silver brazed to shell. It is available in eight capacities up to 100 cu. in. of silica gel, and filtering area in each case is proportionate with capacity of the case.



Hupp Home Units Feature Component Balance

—KEY NO. F-121—

CLEVELAND—The new Hupp 2, 3, and 5-ton air-cooled residential air conditioners, with remote condensers, are being announced by the Perfection Industries Div. of the Hupp Corp. These have been exclusively designed to produce a completely balanced system, the company claims.

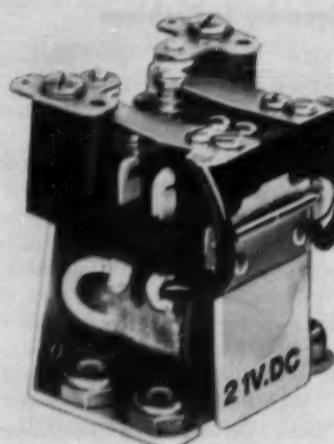
The condenser features a special coil arrangement that sub-cools the refrigerant. The evaporator is built to match the performance of the condenser.

Because each component is balanced with the complete system, the homeowner reaps the benefit of savings in electrical consumption and lowered operating costs, the manufacturer claims.

The blower section on the 2 and 3-ton models can be installed above or below the cooling unit for upflow or downflow operation in any of 30 air flow variations. This reduces the need for special ductwork and eliminates many installation problems, the company asserts. The 5-ton unit has the blower permanently mounted in the upflow position.

Quick disconnect fittings on the

refrigerant lines make field connection to the condenser a matter of only a few seconds. No charging or dehydrating is necessary. For servicing, the disconnect automatically reseals as the connection is loosened.



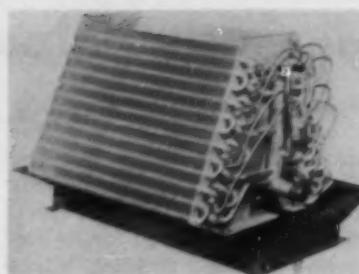
Ohmite Introduces Lightweight Relay

—KEY NO. F-125—

S K O K I E, Ill.—The Ohmite Amrecon model DOS relay has just been announced by Ohmite Mfg. Co. here.

The new relay has a wide range of applications. Specially designed to meet the standards for aircraft relays, model DOS is said to meet industrial needs for a compact, lightweight relay capable of handling power loads usually demanded of larger and heavier relays.

The insulation is of molded phenolic material. Contact rating is 15 amp. at 115 v. a.c. or 32 v. d.c. noninductive load.



'Krack' Produces Furnace Bonnet Air-Cooling Coil

—KEY NO. F-123—

CHICAGO—A "Krack" furnace bonnet air conditioning coil that converts forced air furnace duct systems to summer cooling service was announced recently by Refrigeration Appliances, Inc. here.

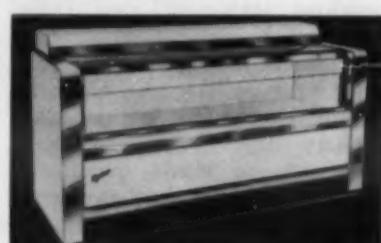
A small, compact V-bank arrangement of coils, the unit can be included in new systems or applied to existing systems, the manufacturer said.

Three models offer 24,000, 36,000, and 60,000 B.t.u. per hour nominal capacities. Tubing is copper electro tin plated. Fins are multi-tube type heavy gauge aluminum.

and heating are incorporated in a single package.

The units are built to fit any location inside or outside of van with easy access for service and maintenance, the company said. Ellis & Watts units are designed to withstand severe vibration, acceleration, shock, or any other road hazards such as salt spray, mud, sand, stones, etc., the manufacturer added.

"Mobile air conditioners of any capacity are available—1 ton to 20 tons," it was stated. "Two independent cooling systems feature a starting lockout control, which reduces inrush current and eliminates the need for a large generator. Hermetically sealed refrigeration system is air cooled—requires no water."



Coldin Adds Open-Type Frozen Food Case

—KEY NO. F-122—

NEW YORK CITY—A new self-contained automatic defrost open-type frozen food merchandiser was introduced recently by Coldin Cabinet Co., Inc., it was announced.

Available only in the 7-ft. length, the case features electric heater type defrost with electric clock mechanism. The cabinet is designed to hold temperatures from 0° to -5° F. under severe operating conditions, the manufacturer states.

Model ADF-84 is of all-steel welded construction with white enamel ends and back top; quadruple glazed display front; porcelain and stainless steel exterior front, the manufacturer further stated.

Mobile Unit Conditioner Developed by E&W

—KEY NO. F-124—

CINCINNATI—Ellis & Watts Products, Inc. here announces the development of a new commercial air conditioning unit designed especially for use in display vans, bookmobiles, and mobile stores.

These units are completely self-contained and require only electricity to operate. Cooling, humidifying, dehumidifying, filtering,

Information Center

For more information on What's New products, current literature and catalogs available, equipment advertised in AIR CONDITIONING & REFRIGERATION NEWS use Key Numbers where designated or specify products advertised and we'll see that you receive this information promptly.

Products Advertised

(list name, page, and issue date)

WHAT'S NEW OR CURRENT LITERATURE AVAILABLE

Key No.	Key No.
Key No.	Key No.
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DETROIT 26, MICHIGAN

Brand new idea
...in testing gauges

It's the new "Serviceman" maximum pressure gauge . . .

Another example of Marsh coming up with an ingenious idea to make refrigeration servicing easier and better!

This time it's a new type of maximum pressure gauge—a gauge that shows top pressure with extreme accuracy, whether you make a short test or leave it over night.

The secret is a check valve that traps the pressure in the bourdon tube until you release it with that handy push button. Then the pointer jumps back to zero. It's so convenient and useful you'll wonder how you ever got along without it!

This Marsh innovation is incorporated in the highly accurate deluxe "Serviceman" testing gauge with 400 lb. scale . . . dressed up in a handsome, polished brass case with a knurled screwed ring which gives quick access to the Marsh "Recalibrator" to keep it always accurate.

Write for facts or see your wholesaler
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Sales affiliate of Jas. P. Marsh Corp.
Dept. D, Skokie, Ill.
Marsh Instrument & Valve Co. (Can.) Ltd.
8407 103rd St., Edmonton, Alberta, Can.

GAUGES • WATER REGULATING VALVES • SOLENOID VALVES • HEATING SPECIALTIES

For more information about products advertised on this page use Information Center, page 26.



Tube, Pipe Insulation Features Zipper

KEY NO. F-126

NEW YORK CITY—A flexible tubing and pipe insulation, fitted with a zipper for easy installation and designed primarily for the air conditioning field, has been announced by Miracle Adhesives Corp. here.

Miracle Adhesives also announced that Owens-Corning Fiberglas Corp. will distribute the new product to supplement its own line of industrial insulations.

Known as "Protekto-Flex," the product includes "Fiberglas" fine-fibered "Aerocor" insulation, a zipper closure, and a tough plastic vapor barrier jacket. The zipper closure provides a water-tight, airtight, moisture vapor barrier seal.

Protekto-Flex is for use on copper pipes carrying chilled, cold, and hot water. It may also be used for high velocity ducts, steam traced lines, and group piping.

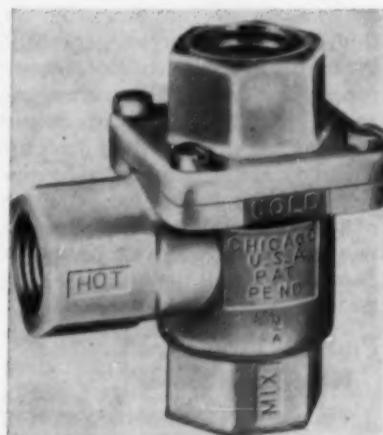
Made for copper tubing sizes from $\frac{1}{2}$ in. to $4\frac{1}{2}$ in., Protekto-Flex is available in black, gray, white, and gray-green colors. However, it is also available in several additional colors and special sizes if so desired.

Protekto-Flex is especially adaptable where carriers are curved, bent, or have irregular surfaces, the company says. For temperatures of from 32° to 350° F., it is resistant to sunlight, acids, alkalies, corrosive salts, fresh and salt water, alcohol, aliphatic hydrocarbons, oils and grease, aging, bacteria, fungus, and plant and animal acids.

Fire-safe, the new product has a thermal conductivity of 0.23 at 75° mean temperature.

The flexible features of the insulation and the jacketing permit installation of Protekto-Flex with the fewest number of cuts, the manufacturer declares. Even when fittings occur, its use eliminates slitting and bonding operations.

The product readily adjusts itself to bends in tubing, passes over sweated couplings, and will take a 90° turn without difficulty.



Dole Valve Mixes Hot, Cold Water

KEY NO. F-127

CHICAGO—The Dole No. 100 water mixer has just been introduced by The Dole Valve Co. It is designed to mix hot and cold water from a storage tank, automatic water heater, or tankless heater to maintain a constant temperature of 140°.

The valve incorporates the Dole power element to assure positive operation. No adjustment is required in the field. The Dole No. 100 water mixed is installed close to the tank or hot water supply.

Federal Offers 2 Display Cabinets

KEY NO. F-128

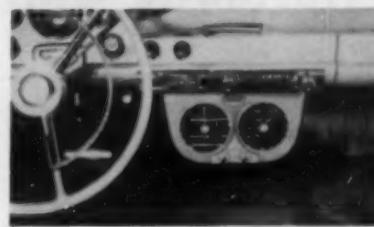
WAUKESHA, Wis.—A new self-contained island frozen food case and a four-shelf dairy merchandiser were introduced at the ARI Exposition at Atlantic City, N. J. by the Federal Refrigerator Mfg. Co. here.

The frozen food case, labeled the 52075C (Island), has 14.1-cu. ft. capacity and a 15.8-sq. ft. display area. Seven-foot long, it has a $1\frac{1}{2}$ -hp. hermetic condensing unit using "Freon-22." Equipped with automatic defrost, the case is available in white finish or any of six basic colors.

The dairy merchandiser features lighting and price tag moldings for each shelf. It has three refrigerated shelves, 29 $\frac{1}{2}$, 18, and 12 in. wide, respectively. The top shelf for related item displays is 10 in. wide.

It has a backboard and front moulding to prevent merchandise from falling.

The Frigikar Corp. president, declared.



KEY NO. F-129

DALLAS—A "MagneTouch" control designed to prevent the accumulation of frost or ice on the coil has been added to the 1956 line of "Frigikar" under-dash automobile air conditioners by the Frigikar Corp.

The new MagneTouch feature eliminates the by-pass valve to solve the freezing problem which heretofore has prevented full efficiency in automotive air conditioners, Bert J. Mitchell, Frigikar president, declared.

It also permits the car owner to select in-car temperature to suit his comfort, Mitchell added.

The Frigikar, introduced a year

ago, will fit virtually all late model passenger cars, station wagons, and convertibles. In the past year, more than 10,000 have been sold, he asserted.

All controls are located on the redesigned Frigikar case. A green-dot light on the face of the case remains lighted only when the unit is refrigerating. New plastic 360° directional air control louvers are provided.

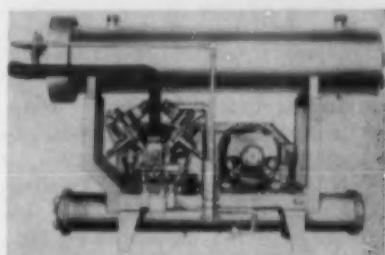
Prices remain at \$298 plus installation.

The 1956 Frigikar cabinet can be finished for color harmony at extra cost. Mitchell claims 30% less installation time is needed than with former models. The unit may be transferred from one car to another.

A three-speed blower control regulates the amount of air delivery, up to 400 c.f.m. Units are available for either 6-volt or 12-volt electrical systems.

Mitchell said that continued territorial expansion enables Frigikar

to offer a limited number of exclusive distributorships with coast-to-coast servicing available.



Curtis Chiller Is for Year-Round Systems

KEY NO. F-1210

ST. LOUIS—A packaged water chiller has been introduced by the Refrigeration Div. of Curtis Mfg. Co. here.

The Curtis water chiller is a complete refrigeration system designed for the latest method of year-round conditioning of multiple rooms. It gives individual control of room temperature. It is made in $7\frac{1}{2}$ tons to 100 tons.

for 1956

MITCHELL

Leads the Way!

3 Red Hot Price Lines...

3 New Product Lines... Promotions Galore!

WE ASKED 5286 DEALERS WHAT THEY WANTED FOR 1956 IN ROOM AIR CONDITIONERS AND THEY TOLD US:

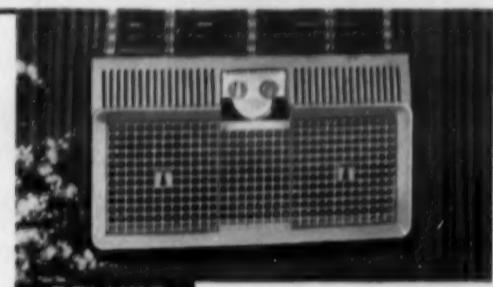
1

PROBLEM: "Dealers want a line of room air conditioners that will convert the hundreds of floating shoppers—(You know 'em—the people who stick their heads in your front door and say 'What's the price?')—into one-stop customers."

SOLUTION: You can stop shoppers by selling them an air conditioner at a price that will freeze them in their tracks and gives them top quality, too.

The DeLuxe Line places the emphasis on high capacity operation. Here is a product quality superior to competitive units selling for as much as \$50.00 more; a product with lowest service costs.

- 11% Cooling Bonus at no extra cost
- High Capacity cooling from compact chassis
- Flush Mount
- 20 Directional air
- High Power Factor Corrected
- Meets 1956 Electrical Code
- Cools, Ventilates, Circulates, Filters
- Permanently lubricated motor
- Double cooling and filtering
- Accessory remote wall thermostat



In $\frac{1}{2}$, $\frac{3}{4}$, 1, $1\frac{1}{2}$ H.P. capacities

For rooms 400 to 945 square feet.

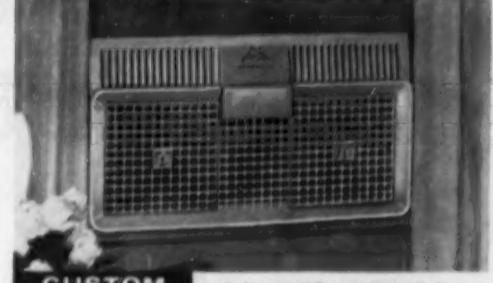
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PROBLEM: "Dealers want to stop selling themselves into a corner on a single price line or brand. They ask for a range of products and prices on one brand for a logical step-up (or step-down) sale."

SOLUTION: You can turn qualified shoppers into customers with an attractive price more than justified by the big cooling capacity—and the industry's most wanted features.

The Custom Line has higher capacity, more powerful components and is more expensive design with an Automatic Thermostat Standard Equipment, Dyna-Heat, Two-Speed Motors—all the features... a larger profit margin on a higher retail price.

- Automatic Thermostat Standard Equipment
- Reverse cycle or resistance heating
- Single Knob control
- High Capacity cooling from compact chassis
- Seven levels of comfort
- Flush Mount
- 13% Cooling Bonus at no extra cost
- Two speed motors
- High Power Factor Corrected
- Meets 1956 Electrical Code
- Permanently lubricated motor



In $\frac{1}{2}$ and 1 H.P. capacities with Reverse Cycle or Resistance Dyna-Heat.

3

PROBLEM: "Dealers want to offer the newest, the finest, the very best for those who realize that superlative quality is worth more than its extra cost."

SOLUTION: With Mitchell you break all sales records. A single room air conditioner cools two rooms yet costs no more than one room unit.

The Imperial is the most powerful room air conditioner ever built. Here is a 2 room air conditioner with Air Flow Modulation and Expando-Mount... top profits from the top of the line.

- Expando-Mount (Pat. Pending)
- Air Flow Modulation
- Cools two rooms
- Single knob control
- Seven levels of comfort
- Resistance heating
- Automatic Thermostat Standard Equipment
- High Power Factor Corrected
- True Flush Mount
- Meets 1956 Electrical Code
- Permanently lubricated motor



In $\frac{1}{2}$, 1, $1\frac{1}{2}$ and 2 H.P. capacities

For areas from 500 to 1480 square feet.



Watch for Your MITCHELL Distributor's Showing!

...HEAR about 30% on 1/3 Guaranteed Sales

...BE a part of the largest local advertising program in air conditioning

...GET paid to display Mitchell early... see the line dealers designed

Internally Spring-Mounted Hermetic Unit Protection Problems Told

ST. LOUIS—Some of the problems involved in protecting motors of internally spring-mounted hermetic units were outlined at the recent conference on Application of Motors to Space Heating and Cooling Equipment sponsored here by the Committee on Rotating Machinery and the St. Louis section of the American Institute of Electrical Engineers.

Proper Protector Location Important

Proper location of inherent protectors is most important, it was emphasized in a paper prepared jointly by A. P. White of Spencer Thermostat Div., Metals & Controls Corp., and T. O. Pihl of Tecumseh Products Co.

Best protection against motor overheating is obtained with the inherent protector located on

the shell at the point of fastest temperature increase, it was indicated. Actual temperature values are less important than rate of temperature increase, the authors concluded.

Top of the unit is the best location, they declared.

"In first hermetic designs, the motor capacity was more than ample for the normal amount of work to be done resulting in little likelihood of any harmful abnormal overload currents other than stalled rotor. With excess capacity, it was relatively easy to obtain stalled rotor protection using a protector mounted remotely from the compressor and responding essentially to current only," explained White, who presented the paper.

"The designers in their quest for greater compressor capacity

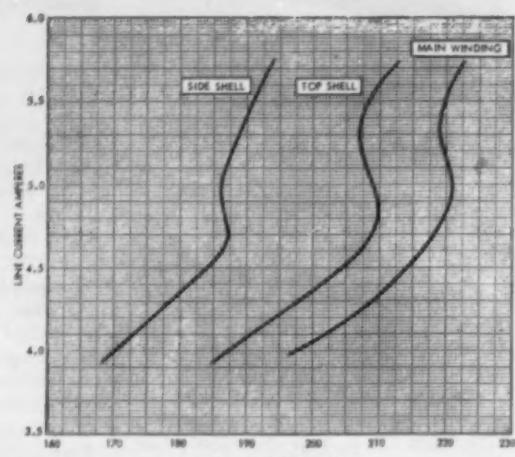
at lower costs, undertook programs of increasing the compressor and motor efficiencies and allowing higher motor temperatures to occur as field experience dictated. The motor was being worked harder; winding temperature was allowed to rise to higher levels.

Needed Better Overload Protection

"This created the necessity for better and more accurate overload protection and encouraged the application of inherent overheat protectors which had already enjoyed success on conventional motors," he explained.

"Let us take a brief look at the principle of inherent overheat protection. The theory revolves around the premise that the temperature of the ideal protector follows the winding tem-

FIG. 1 shows temperature curves of shell (side and top) and main winding during running test of $\frac{1}{4}$ -hp. 115-volt medium back-pressure hermetic compressor under 110° F. ambient.



perature with no lag. In practice, this is obtained by mounting the protector so that the protector is subject to heat from the motor windings. This results in some increase in temperature at the protector.

"Then the motor current flow through the protector disc and heater is used to produce a further increment in temperature in the protector, raising its temperature to correspond to the winding temperature. The protector opening temperature is fixed to correspond to the maximum safe winding temperature. Therefore, whenever the motor winding reaches its safe temperature limit, the protector reaches its opening temperature, protecting the motor," said White.

Less Heat from Windings Means More from Protector

"The less heat conducted to the protector from the motor windings, the greater must be the heat generated within the protector itself. This is in the direction of remote mounted protector performance. Conversely, a protector located so that it receives more heat from the motor windings has less lag and approaches the 'ideal protector.' This applies to both running overload and stalled rotor conditions."

"From the viewpoint of the protector engineer, the hermetic protection problem essentially involves two basic compressor designs. One is with the motor pressed into the hermetic shell and the other with the motor internally spring mounted."

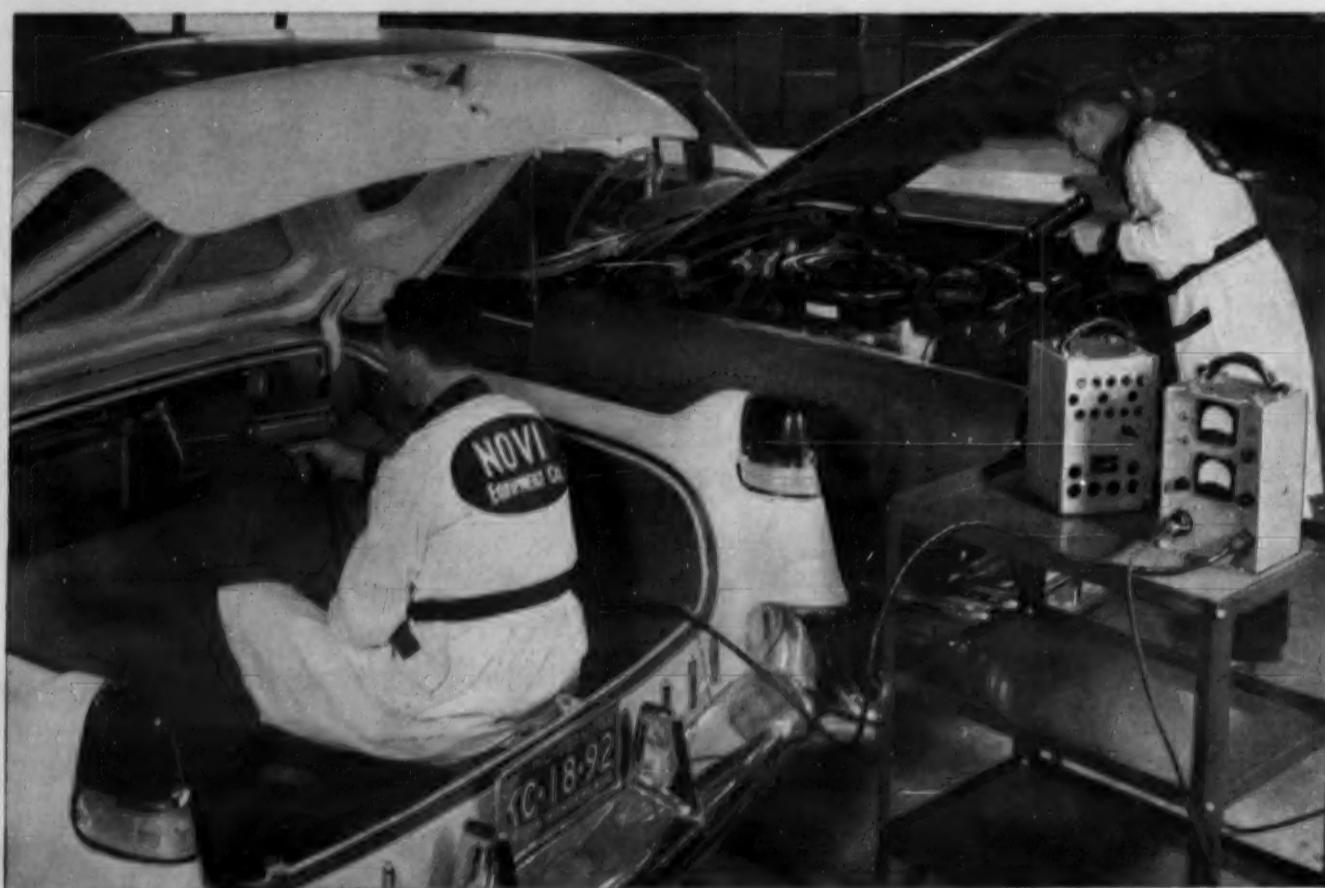
"In the pressed-in design it is relatively easy to obtain protection of the motor with the thermal protector mounted on the hermetic dome and generally located adjacent to the motor terminals. With this arrangement, the heat of the motor winding is conducted directly through the stator iron to the dome, making the temperature of the protector location directly responsive to winding temperature with a relatively small gradient."

Problem Increased In New Type Motor

"In the internally spring mounted type, which was developed as a means of reducing noise, the problem of providing protection to the motor is increased. The inherent overheat protector mounted on the dome is thermally separated from the motor by the refrigerant gas surrounding the motor. It is necessary to rely on conduction of the heat through the gas."

"Motor cooling in this type of design is a function of the refrigerant gas density and its temperature and mass rate of flow into the compressor housing. The refrigerant gas density and mass rate of flow are a

(Continued on next page)



RAPID, ACCURATE CHECKS ARE MADE ON AIR CONDITIONING SYSTEMS BY NOVI EQUIPMENT CO. SERVICEMEN WITH G-E LEAK DETECTORS

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Service Costs Cut 85% with G-E Leak Detector

"85% of our service repairs on auto air conditioning units were due to loss of Freon* at a cost of approximately \$5.00 per repair," says Mr. Lewis W. Welch, president of Novi Equipment Company of Novi, Michigan. "Since we adopted the G-E leak detector as a standard item in our repair kits, complaints have been reduced to almost nil. We are in the process of equipping all of our 90 factory installation centers with G-E leak detectors to assure that our customers will receive the best possible initial installation."

Like Novi Equipment Company, you can benefit from these outstanding features of the General Electric Type H-1 leak detector:

SIMPLE IN OPERATION, the detector will locate leaks in any system which contains a halogen compound, or into which such a compound may be introduced as a tracer.

EXTREMELY SENSITIVE, the detector will detect a leak as small as 1/100th ounce of Freon* a year.

LOW IN PRICE, the detector costs only \$604.50** complete. For more information contact your nearest General Electric Apparatus Sales Office or write for bulletin GEC-233 to Section 585-30, General Electric Co., Schenectady 5, N. Y.

*Registered trade-mark, Kinetic Chemical Division of E. I. DuPont de Nemours & Company.

**Manufacturer's suggested retail price.



MANY APPLICATIONS are possible with the General Electric Type H-1 leak detector. Lightweight and portable, it also features audible leak indication.

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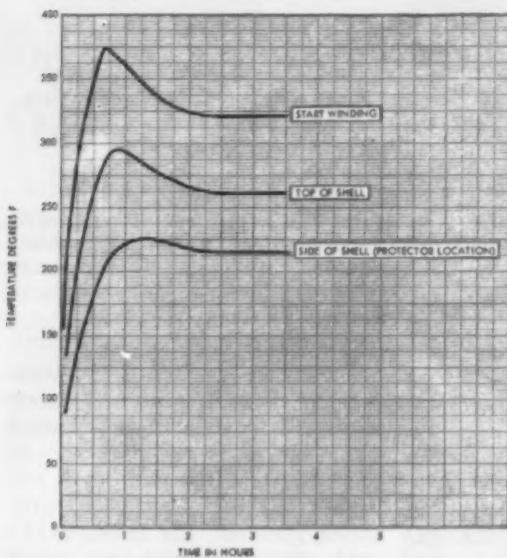


FIG. 2 records maximum temperatures read at instant of protector opening for each cycle with protector mounted on side of shell of $\frac{1}{4}$ -hp, 115-volt capacitor start capacitor run motor semi-pressed in high back-pressure hermetic compressor during stalled rotor test.

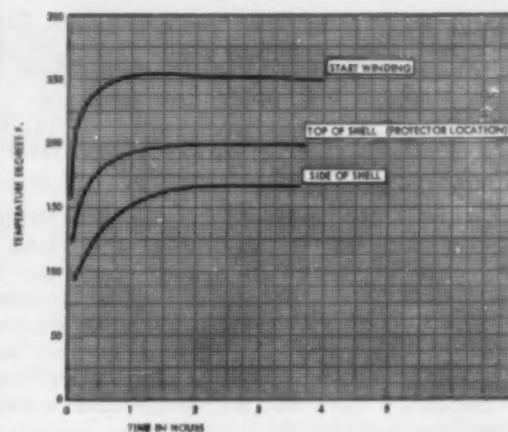


FIG. 3 gives corresponding data for unit of FIG. 2 with protector located on top of shell.

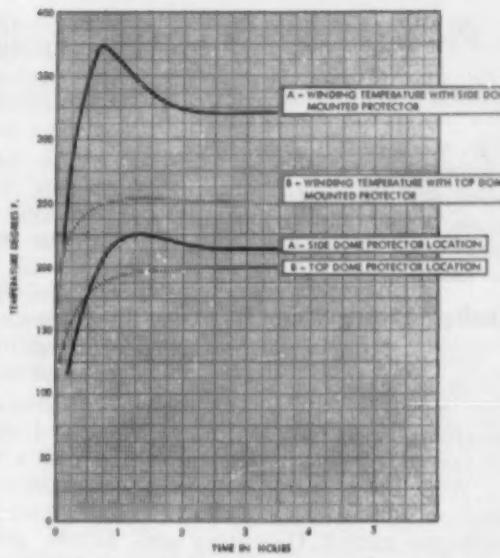


FIG. 4 compares data given in FIGS. 2 and 3.

Protection Problems--

(Continued from preceding page)
function of the evaporating temperature," White explained.

"Compressors are designed to operate over a specific evaporating temperature range falling roughly into three categories; low, medium, and high. In applications such as freezers where extremely low evaporating temperatures are required, the rate of heat conduction through the rarefied gas is low, and large temperature gradients of motor winding to protector location are encountered.

"In certain designs, this gradient may indeed be so high as to produce an increase in motor temperature with a decrease in motor loading. By proper attention to compressor and motor efficiencies and application details, the temperature of the outside of the housing can be made to follow the motor temperature with a fairly constant gradient over the necessary evaporating temperature range and adequate protection can be obtained.

Room Units at Other End of Problem

"At the other end of the protection problem are room air conditioners which are high evaporating temperature range applications. Here it has become evident that the matter of heat transfer from the winding to the protector must be given special consideration.

"Because of the high refrigerant gas density and mass rate of flow in the compressor housing, the motor cooling may exceed the compressor and motor efficiencies and it may be difficult to overheat the motor windings. Unlike the low and medium evaporating temperature range applications where the

maximum safe continuous over-time without encountering dangerous motor temperatures. NEMA full load torque, it is found that the motor can be operated very near its breakdown torque for long periods of

time without encountering dangerous motor temperatures. This means that running currents are higher than usual and it is not uncommon for the ratio of stalled to running current to be as low as two and a half to one. While protection against running overloads can be obtained quite easily, the over-all protection problem which includes stalled rotor be-

comes difficult unless suitable provision is made in the compressor design for protector mounting," commented White.

"Let us follow through a typical inherent overheat protector application. The first step is to make a temperature study of the complete compressor. Tests for running overload conditions can be made with several different dummy protector locations provided on the hermetic shell.

"This data is obtained at conditions of maximum ambient temperature surrounding the compressor for which the unit is designed (usually 115° F. for room coolers and 110° F. for household refrigerators, freezers, etc.). It might be noted here the refrigeration industry deals in degrees fahrenheit instead of degrees centigrade as used in the motor industry.

"A series of heat runs are made at different values of load. For the low and medium back (Concluded on next page)

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new air conditioning development by
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SEE THE LENNOX
AD ON PAGES 14-15

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Hermetic Unit Protection Problems -

(Concluded from preceding page) creases from 4.9 to 5.6 amperes. pressure applications, the value of load used in the last run would be such that the winding would be raised to the maximum allowable temperature level for running load protection. (This is usually considered 250° F. for Formvar insulation and F-12 refrigerant.)

"For high back pressure applications when the windings will not overheat for any running load, the last heat run load point would be just before breakdown torque is reached," White explained.

A typical set of curves is shown in Fig. 1. The compressor used was rated $\frac{1}{4}$ hp., 115 volts and designed for medium back pressure application.

"Gas cooling of the motor is illustrated in the range where the winding temperature actually decreases while the load in-

area on the shell obtained with different locations. Test data is stalled rotor rather than base included for each of two models the protector location on the room cooler (high back pressure distribution for sure) compressors.

"The hottest location during running loads is evident from inspection of the heat run data. But for stalled rotor an indirect test must be used to determine the temperature distribution on the hermetic shell in relation to winding temperature," White pointed out.

"Various methods can be used. However, one method is to run a trial stalled test with an operating protector sample in a trial location. The data obtained provides a temperature distribution pattern on the shell and further tests can be made with protector samples mounted at the preferred location.

"With these data, an approximation can be made for the protector rating. Operating protector samples are then installed on the test compressor and data accumulated for load conditions at which the protector trips. But at what point on the shell should the protector be installed?

"For the best performance it will be shown that the protector should be located at the hottest

"To illustrate this, a series of stalled rotor tests were made on several compressors. On each test compressor, the same sample protector was installed in the exact same protector sample

First Unit Discussed Is $\frac{3}{4}$ Hp.

"The first unit which will be discussed is a $\frac{3}{4}$ -hp., 115-volt capacitor start and run semi-pressed in compressor and for which data is shown in Figs. 2, 3, and 4. The temperature points plotted are the peaks of the cycles and were read the instant the protector opened. Thus these are envelope curves of maximum temperature.

"The data for Fig. 2 was obtained with the protector mounted on the side of the shell and the peak winding temperature of 374° F. was recorded after approximately $\frac{3}{4}$ hour cycling. The test established that the temperature at the top of the shell was the highest.

"So another test was run with

*Stalled rotor test data of compressor in Fig. 1, measuring heating rate of hottest winding under test conditions of 115 volts and 80° F. ambient.

mounted on the top of the compressor shell. The data is shown in Fig. 3 and the peak winding temperature was reduced to 253° F. This shows that the higher the temperature at protector location, the lower is the peak stalled temperature for a particular protector.

"To see whether the actual or instantaneous value of temperature at protector location was of importance, the data of Fig. 2 and 3 were replotted on Fig. 4. With the side protector location, the protector location temperature increased at a slower rate than the winding and so a high peak temperature resulted. At the top location, the protector location temperature increased at the same rate as the winding to give a lower overall level of temperature.

"It is evident from the curves that in the first 30 minutes of cycling, the top mounted protector test shows the protector location temperature increasing at a faster rate than with the side location. This is the important factor rather than the actual temperature value.

"It shows that a peaking temperature characteristic can be reduced by choosing a location for the protector on the shell where the rate of temperature increase is highest," he said.

"A similar series of tests were run on a 3-hp., 230-volt, three phase compressor. With the protector mounted on the side of the shell, the peak winding temperature reached 315° F. This was reduced to 257° F. with the same rating protector mounted on the top shell.

"In both of these applications, adequate running protection could be obtained with the protector located either on the side of the shell near the motor terminals or on the top dome. But it was not found possible to improve the degree of stalled rotor protection afforded the motor through any change in protector characteristics (without slow transfer of heat and for the high gradient at the side location).

"The crux of inherent overheat protector applications, it is evident, is the location of the protector with regard to transfer of heat from the motor winding. It is not always possible to design the protector to compensate for the inadequacies of its location in attempting to favor mechanical considerations.

"Factors other than protector location should not be minimized, however, to achieve successful operation of the inherent protector. The mechanical details of the installation and uniformity in mounting for production units is important.

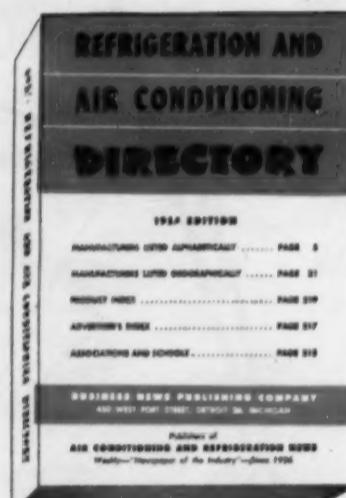
"For example, the winding leads connected to the protector terminals conduct heat from the protector. If larger leads are used in production than were used in the original engineering application tests, the amount of heat conducted from the protector will be increased.

Table I*

Line Amperes	Time Sec.	Start Winding
20.7	0	80°F
19.2	19	122
18.2	38	167
16.8	108	257

THE EDITORS OF
AIR CONDITIONING AND REFRIGERATION NEWS
ANNOUNCE:

The Brand New 1956 REFRIGERATION and AIR CONDITIONING DIRECTORY



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Refrigerated Warehouse Conference Set for Purdue University Jan. 23-26

LAFAYETTE, Ind.—Many aspects of refrigerated warehouse operation will be discussed at an advanced training conference to be held at Purdue university here Jan. 23 to 26.

The conference is being sponsored by the Refrigeration Research Foundation and the National Association of Refrigerated Warehouses. Meetings will be held at the Memorial Union Bldg. on the campus.

In addition to talks and panels several discussion group sessions have been scheduled for the four-day conference. These include sales, public relations, industrial relations, freezing, environment, mechanical handling, and others.

Discussion group meetings will run simultaneously, but will be repeated so all can attend each topic.

Conference program follows:

SUNDAY, JAN. 22

6 p.m.—Get-together party, Fowler hotel.

MONDAY, JAN. 23

8 a.m.—Welcome to Purdue, Dean H. J. Read, Garth Shoemaker. Conference keynote, John Mock.

9 a.m.—"Sales of Warehouse Services," John Mock.

10 a.m.—"Industrial Relations," Ray Keiser.

11 a.m.—"Public Relations," Sam Shapiro.

1:30 to 4:30 p.m.—Discussion group meetings on sales, public relations, industrial relations.

4:30 p.m.—Free conference hour.

7:30 p.m.—Movie on public relations.

TUESDAY, JAN. 24

9 a.m.—"Mechanical Handling," Burns Speer.

10 a.m.—"Freezing of Commodities," V. C. Patterson.

11 a.m.—"Control of Stored Products Environment," P. B. Christensen.

1:30 to 4:30 p.m.—Discussion group meetings on mechanical handling, environment, freezing.

4:30 p.m.—Free conference hour.

WEDNESDAY, JAN. 25

9 a.m.—"Warehouse Operation and Management," William Ready.

10 a.m.—"Functional Packages," Charles Zusi.

11 a.m. to 3:30 p.m.—Discussion group meetings on warehouse operation, packages, personal conferences.

3:30 p.m.—Panel discussion on commodities on storage by Paul Vollmer, David Tyson, J. G. Woodroof, H. C. Diehl.

4:30 p.m.—Free hour.

7:30 p.m.—Informal round table on food radiation, W. J.

Servel Parts Suppliers Streamline Handling of Exchange of Hermetic Compressors, Power Units

EVANSVILLE, Ind.—Servel handling of replacement transactions have been greatly simplified by our new procedure so that the parts supplier and his customer will have considerable time," Eager said.

Under the new warranty handling plan the serviceman, dealer, or contractor will furnish model and serial numbers from inoperative units, but the parts supplier no longer needs to check warranty and installation record files before furnishing the replacement part since this will be handled at the factory.

The new procedure became effective Dec. 15, 1955, according to George S. Eager, service manager for Servel's commercial refrigeration division. "Warranty records and the

when the equipment is checked and found by the factory to be defective and in warranty.

The Servel warranty policy provides two plans. A standard one-year warranty covers "Supermetac" power units and condensing units for a period of 12 months from date of original installation. The other plan, a five-year protection plan, provides for the standard one-year coverage, and an additional four years on the power unit (motor-compressor assembly). This plan must be purchased at the time the unit is ordered from the factory.

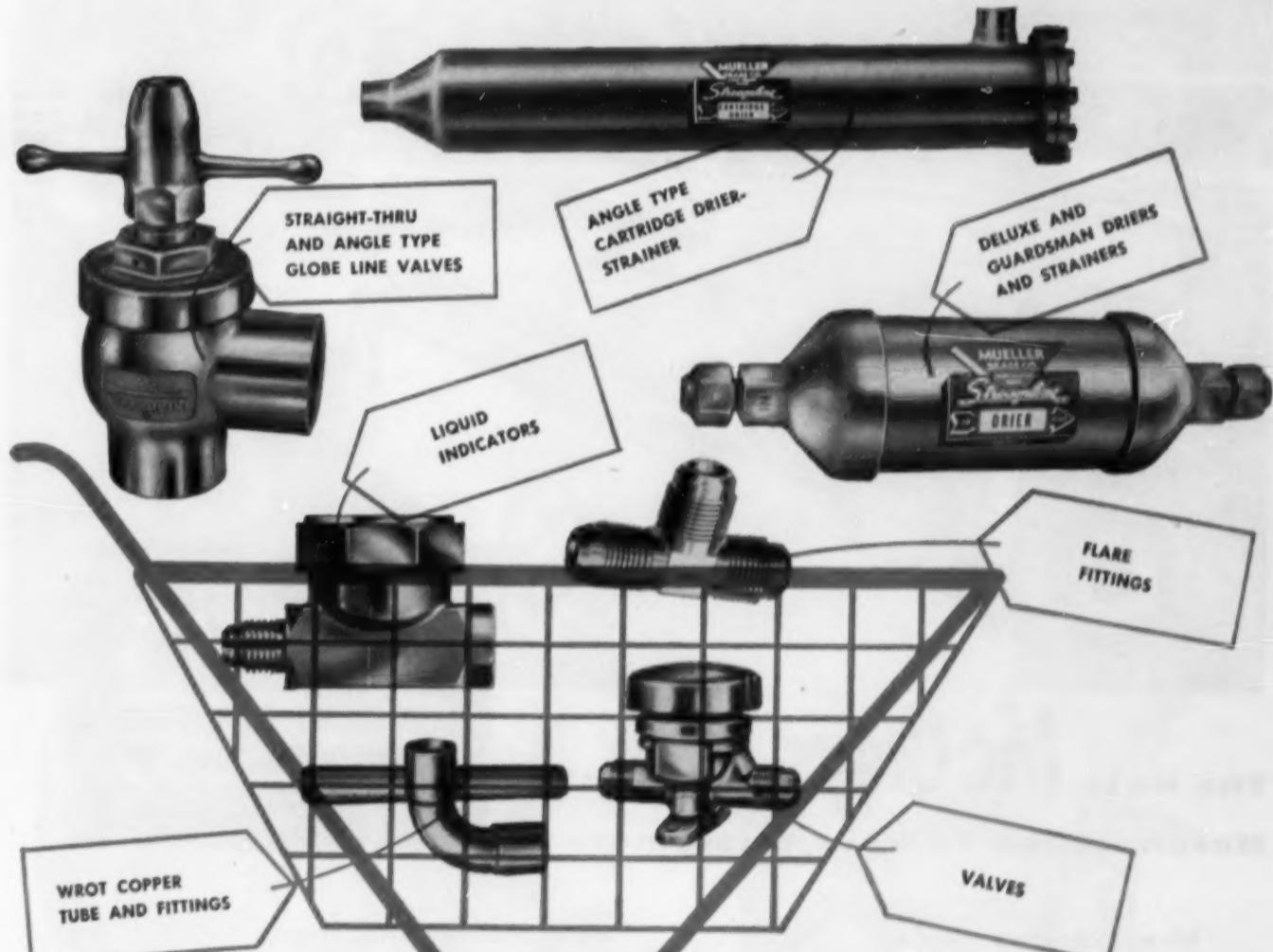
R. B. Richardson Named

DETROIT—R. B. Richardson Co. here has been appointed distributor for the Detroit area, Ingersoll-Rand Co. announced.

A sales and service firm for small compressors, R. B. Richardson Co. will now offer this service for up to 125-hp. Ingersoll-Rand compressors.

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• Watch for it! Hear Sat. Friday of Dragone fame give the plain facts about the revolutionary new air conditioning development by Lennox.

SEE THE LENNOX
AD ON PAGES 14-15

MUELLER BRASS CO.

PORT HURON 9, MICHIGAN

For more information about products advertised on this page use Information Center, page 26.

Super Freezer Overlap Doors with Heater Cables Eliminates Frosting, Sticking of Door Gaskets

CHICAGO—Patrick J. Duffy of Jamison Cold Storage Door Co. told a recent meeting of the Chicago Section of the American Society of Refrigerating Engineers that there was a definite lack of acceptance of the improvements made in cold storage door construction.

He said that designers, engineers, and specifiers were at times reluctant to accept improvements and continued to buy products which had been in use for some 25 years.

Reviewing the basic facts of door construction, Duffy pointed out the necessity of a double vapor seal on doors 32° F. and above. At 25° F. a single warm side vapor barrier was required, he stated.

Most of the doors today, he said, are plywood with metal

cladding. This is not only to protect it from physical abuse but to reduce the danger of rotting and decay.

By the use of slides and diagrams, Duffy illustrated the super freezer overlap doors with heater cables. This has eliminated the problems of frosting and sticking of door gaskets, it was noted.

Discussing the problem spots of cold storage doors, he made the point that the plain wood door applied wrongly would soon go to pieces. This was especially true in doors above 32° F., he said.

One of the things to be taken into consideration in the design of the size of doors is the size and height of the truck, according to Duffy. He recommended that the door be 6 in. higher

than the uppermost part of an elevated truck. The width should be 2 ft. wider on both sides than the truck.

This is a simple rule of thumb guide which should be of benefit to designers and owners, he commented.

Duffy noted that one of the newest products of his company is the horizontal sliding cold storage door. This door is particularly useful where the swinging door would require a great deal of room or swinging space, he pointed out. It is of special value around a narrow dock area, he added.

RCA Tube Div. Bldg. To Be Air Conditioned

HARRISON, N. J.—Radio Corp. of America Tube Div. recently announced award of a contract to Turner Construction Co. to build a new one-story completely air conditioned plant at Somerville, N. J.

NARGUS Los Angeles Convention Exhibit Space Now Sold Out

CHICAGO—A complete sell-out of exhibit space for the 1956 convention of the National Association of Retail Grocers next June 10-14 at the Shrine Auditorium and Exhibition Hall in Los Angeles was reported by Mrs. Marie Kiefer, NARGUS secretary-manager and convention director.

NARGUS expects an attendance of 14,000 food merchants and their suppliers at the 1956 convention.

Reservations for the convention and for hotel accommodations, as well as reservations for post-convention Hawaiian tours, should be made through headquarters office of the National Association of Retail Grocers at 360 N. Michigan Ave., Chicago.

Freezer Warehouse Test Shows 'Dry-Wall' Tilt-Up Method Functions Well

ATLANTIC CITY, N. J.—Laboratory predictions of vapor-vented insulation performance in a freezer warehouse were subjected to a unique practical test when the warehouse itself was fully instrumented during construction to permit scientific studies under actual operating conditions, the American Society of Refrigerating Engineers learned during its 51st annual meeting here.

ENGINEERS REVEAL FINDINGS

Consulting engineers Elmer R. Queer and E. R. McLaughlin revealed their findings about a 1,300,000-cu. ft. freezer warehouse constructed in Memphis using the "dry-wall" tilt-up method.

One of the things they hoped to do with the instrumentation was to add new information on the "long-standing controversy between the proponents of single versus multiple vapor barrier constructions and vapor-impermeable versus vapor permeable insulation assemblies," they explained.

To check on the insulation performance, thermocouples, heat flow meters, and moisture blocks were installed at various locations in the warehouse during construction.

FIBROUS GLASS INSULATION USED

Fibrous glass insulation was used throughout, 8 in. in the walls and floor, 10 in. in the roof. Vapor barrier in the walls was a laminated paper consisting of two layers of kraft paper bonded to a core of aluminum foil. Vapor barrier arrangement vented the insulation to the inside or cold side of the walls.

According to Queer and McLaughlin, the fibrous glass insulation was found to give "excellent thermal performance" for warehouse practice.

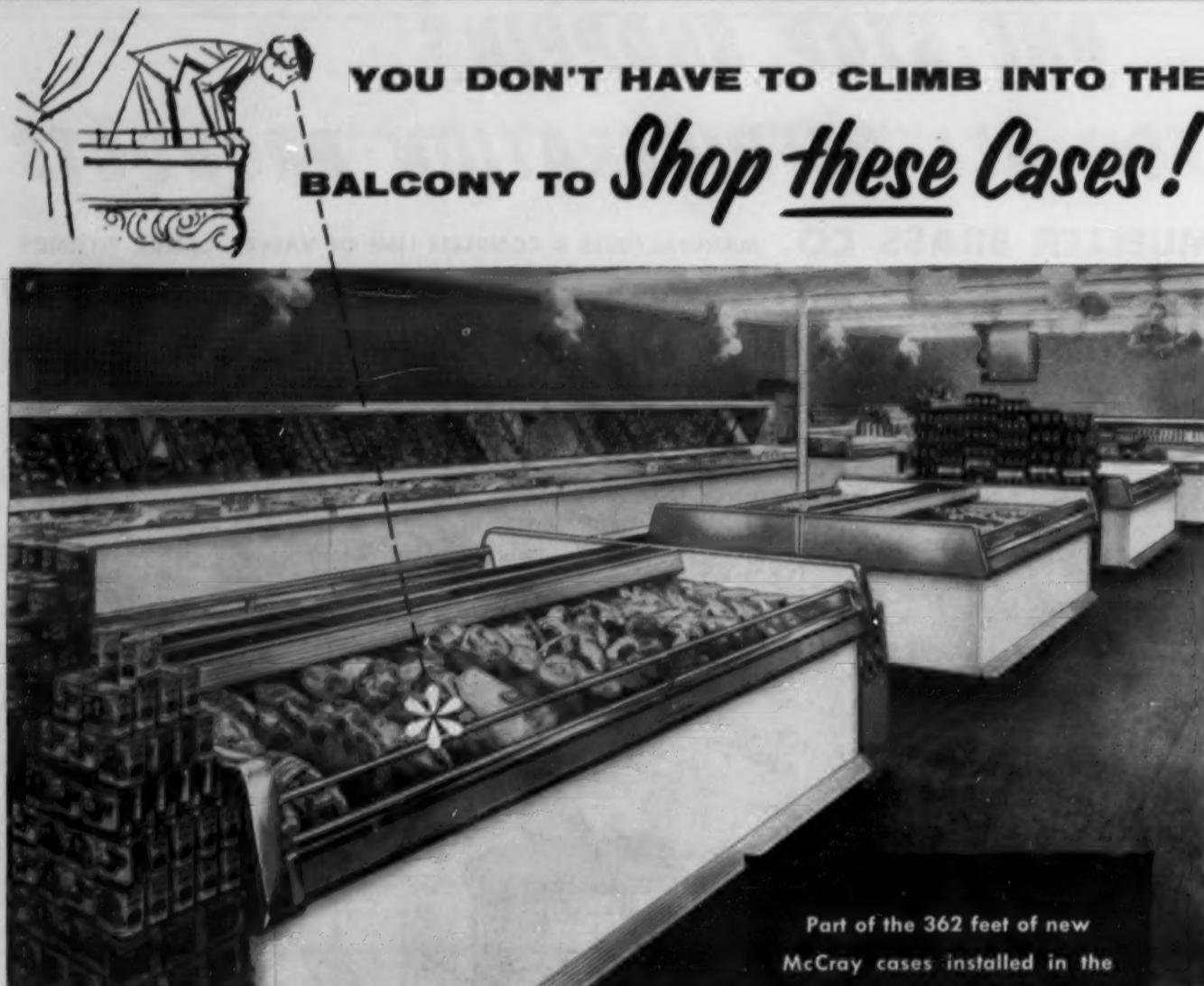
"The indicated thermal conductivity (k) of the insulation in place is 0.22 B.t.u./in.²/hr.^oF.," they stated.

Vapor movement occurred through the construction as predicted, they also commented, citing one instance where moisture trapped in the roof insulation due to rains during construction migrated a considerable distance to escape through the porous wall surface. Ice which formed when this moisture reached the freezing zone appears to be sublimating to the freezer coils, they declared.

CONCLUSIONS

As a result of these tests, the authors of the paper see no need for horizontal convection barriers in the insulation for operating temperatures down to -20° F., although they think such barriers may be "reasonable" in freezers operating at much lower temperatures.

The actual temperature and moisture readings taken in this warehouse weren't as consistent as laboratory findings, they admitted, due to variations in weather and operating conditions, but they dismissed this as being of "minor consequence."



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For more information about products advertised on this page use Information Center, page 26.

SLANTS ON SERVICE

"Slants on Service" is a "package" devised by the NEWS to meet the needs of its busy readers in the service and contracting business.

Some General Questions and Answers From RSES 'Information Please' Session

ATLANTIC CITY, N. J.—Questions on automobile air conditioning, mufflers for refrigeration systems, and metal fatigue dominated the first "Information Please" session sponsored by the Refrigeration Service Engineers Society at its convention here recently.

During the information please period, men in the audience shoot their problems at a panel of experts. The "experts" then gave the servicemen the benefit of their experience and thinking.

Here are some of the questions and the gist of the answers:

Q. What is the tonnage, piston, and stroke of the compressor on the Nash Rambler auto air conditioner?

(This and the following questions on automobile air conditioning were answered by S. O. Wahamaki, project engineer, and R. F. Reshan, technical service representative for American Motors Corp.)

A. It is a two-cylinder inline compressor with a displacement of 8.6. It has a 2-in. bore and 1 1/8-in. stroke. The compressor operates at .975:1 of car engine so that the natural periods of the compressor will not coincide with those of the engine.

We don't know the tonnage of the system and don't like to estimate at high speeds because the curve of compression flattens out. At 30 m.p.h., it is estimated at 1 1/2 tons.

SYSTEM STOPPED REFRIGERATING

Q. We had a complaint once that the air conditioning system on the car just stopped refrigerating. What would cause that?

A. It might be the brushes on the magnetic clutch. We had a little trouble with that in previous models.

Q. On the Hudson auto air conditioner, do you filter the air across the coil?

A. In our system, we have a filter ahead of the heater core. It can be replaced and we recommend that it be done periodically.

Q. What about the condensate?

A. The plenum is so designed that it catches the water, which then passes through a drain tube and out of the car.

Q. What make of compressor is used on the Rambler air conditioner?

A. It is a standard Tecumseh compressor. You can buy it at a regular Tecumseh outlet.

Q. Do you have a formula for sizing a muffler to muffle gas pulsations in a compressor? With the growing acceptance of high speed compressors we are getting this more and more. It gets annoying to the customer.

A. (By John Spence, service manager, Hussmann Refrigerator Co.) I don't know of any formula but we have found that there is a trend to use 90° elbows on suction lines in food markets. By reducing the bend and rounding out the line, we

into the head and eliminating that noise.

(By Gene Hamilton, service manager, distributor division, Worthington Corp.) We have a formula that no engineer agrees with. We use 10 times the displacement of the compressor. But that will make a much larger muffler than the engineers say is needed.

But whatever size muffler you use, make sure it is installed so oil can be blown on through or you will need some means of getting it back to the compressor.

Noise reduction is not a single problem or a problem that has a single answer. You may take the noise out of one place and transfer it to another. It may move from the compressor to the condenser, for instance.

Q. On a "Freon-12" freezer, which has an air-cooled 3-hp. motor, we get an average suc-

tion pressure of 2 lbs. But the whole charge of "Freon." I put on a second vibration eliminator and this broke in 10 days. I put on a third one, which operated about 30 days. Then the elbow in the line cracked. I fixed this and it held out for the rest of the season.

I am not sure just what caused this but I believe it was metal fatigue. It seems to me it would be better to replace the entire discharge line.

A. (By Spence). Some vibration eliminators have a larger tolerance on the female end. So, to get a tight solder fit, the serviceman may overheat the vibration eliminator and weaken it so that it will break soon.

And, unless the tube is good when the bend is made, the bending process will cause cracks on the inside of the bend. These will lead to leaks.

When you get a break in the discharge line, it is better to replace the entire line.

VIBRATION ABSORBER KEPT BREAKING

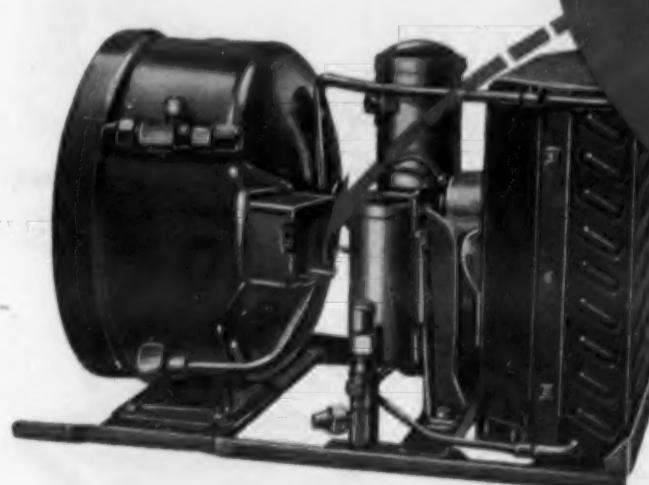
Q. I was called in to repair the leak in a broken line on a large air conditioning system using a 50-hp. motor and a 1 1/8-in. discharge line. I repaired the leak and put on a vibration absorber.

After one week, the vibration absorber broke and we lost the

EASIEST HERMETICS TO INSTALL AND SERVICE

KELVINATOR EXCLUSIVE!

New Plug-In Relay
is both a starting
relay and thermal
overload protector



JUST PLUG IN
OR PULL OUT!

No Wires to
Motor Terminals

- ★ Lighter weight; more compact, simplest mounting.
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For additional information write Commercial Advertising Dept., Kelvinator Division, American Motors Corp., Detroit 32, Mich.

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SPECIALISTS IN REFRIGERATION SINCE 1914!

Current Literature

General Controls Issues Valve Line Catalog

KEY NO. R-120

GLENDALE, Calif.—A new catalog, covering its enlarged line of thermostatic expansion valves was recently issued by General Controls Co. here.

Also included are illustrations, drawings, and data on the complete line of refrigerant distributors, thermostatic expansion valves, and solenoid valves designed for mobile applications, the announcement further said.

In addition, new three-way solenoid valves for refrigeration models K-103, K-123, K-113, and K-133, midget solenoid valves for water, K-27 and K-21 series, and three-way solenoid valves for air, K-273 and K-274 series are discussed.

An enlarged engineering section aids in selecting the right solenoid valve or expansion valve for a specific job, the manufacturer emphasized.

Other items on which data is given include motor starters, contactors, relays, airmotor valves, factor.

hydromotor (motor operated) valves, water regulating valves, air conditioning thermostats, master control panels, light and heavy duty spacestats, and line voltage cooling or heating thermostats.

32-Page Booklet Covers Frick Compressor Line

KEY NO. R-121

WAYNESBORO, Pa.—A 32-page booklet, with seven tables, covering the firm's entire line of compressors was published recently by Frick Co.

Bulletin 80-D includes tables on properties of saturated ammonia, saturated "Freon-12," saturated "Freon-22," and brines, a condensed list of storage temperatures, comparison of thermometer scales, principles of refrigeration, and U. S. equivalents of weights and measures, the company said.

Explained are uses and features of Frick equipment with illustrations, diagrams, and specifications of all units, according to the manufacturer.

UsAireo Booklet Traces Comfort Cooling History

KEY NO. R-122

MINNEAPOLIS—The development and use of self-contained central station air conditioning are given comprehensive coverage in a new 36-page booklet published by United States Air Conditioning Corp. here.

Called "Why RK?" the two-color, illustrated publication traces the history of comfort cooling in non-technical terms. It discusses the evolution of present-day techniques and development of the UsAireo RK unit, "a single compact device which contains, in one casing, all of the elements of a central air conditioning plant which provides up to 60 tons in cooling capacity."

A three-page pull-out shows the treatment of a typical building with built-up, packaged, and RK systems. A tabulation of design and cost factors shows claimed savings effected by the use of RK equipment.

Additional diagrams show the

application of the RK to 12 different types of business establishments.

Bulletin Details Remote Air-Cooled Condensers

KEY NO. R-123

PITTSBURGH—Bulletin AC-100 which details Halstead & Mitchell's new remote air-cooled condensers is now available from the company.

Features discussed include the core design which allows high air volumes at low speed, four-blade deep-pitch fans for quiet operation, and steel casings protected against corrosion by Vinsynite, Vinyl Zinc, and chlorinated rubber, the firm stated.

A table of performance data for various size units at 40°, 20°, 0°, and -20° suction is presented. A second table outlines coil and fan data, it was reported.

Dimensions, weights, and sketches showing construction features and mounting arrangements are also given, the company said.

Airtemp Booklet Explains Water-Cooled Conditioners

KEY NO. R-124

DAYTON—Made available recently by Airtemp Div. of Chrysler Corp. was an eight-page booklet giving information on a redesigned line of "Commercial Water-Cooled Packaged Air Conditioners," the manufacturer announced.

The multi-colored L-241 booklet contains unit specifications, illustrations, and explanations of Airtemp's new packaged unit models, the firm said.

Servel Folder Covers Condensing Units

KEY NO. R-125

EVANSVILLE, Ind.—Specification and capacity data covering the complete line of Servel "Supermatic" condensing units is now available in a new condensed folder issued by the Commercial Refrigeration Div. of Servel, Inc.

Included are illustrations of representative models in all sizes for low and medium-temperature applications. Cross-section drawings of new hermetically-sealed single-cylinder and twin-cylinder power units are shown with a listing of new performance features.

Information on the range of Servel condensing and power units is also included in the folder, along with an explanation of model designations by type and horsepower for the complete line.

Catalog Illustrates Full Peerless Line

KEY NO. R-126

MT. VERNON, N. Y.—A new two-color illustrated 12-page catalog describing the full Peerless commercial refrigerator, display case, and freezer line for 1956 was issued recently by Peerless Equipment Sales Co. here.

The catalog gives complete specifications, price list, and back and front views of all old and new models, the company said.

Wabash Catalog Shows 1956 Line

KEY NO. R-127

CHICAGO—A new catalog, No. 561, covering Wabash products for 1956, has been issued recently by Wabash Corp. here.

Among the new items shown in the catalog are capillary tubes covering the range from $\frac{1}{2}$ to $\frac{1}{4}$ -hp. units for both "Freon-12" and "Freon-22," and a new line of "Hi-Dri" heavy-duty driers.

Regular lines of Wabash driers, strainers, and cap tubes are also covered in the new catalog.

Copies are available free on request.

Bulletin Explains B&G Sizing Method

KEY NO. R-128

MORTON GROVE, Ill.—Bell & Gossett Co. here recently announced publication of an eight-page, two-color manual for sizing cooling tower pumps and piping.

Bulletin GR-155 explains in six steps the B & G method of sizing. Illustrations, charts, tables, and a work sheet are included, the manufacturer said.

COMING in your mail...Free Record

* Watch for it! Hear Sat. Friday of Dragnet fame give the plain facts about the revolutionary new air conditioning development by Lennox.

SEE THE LENNOX

AD ON PAGES 14-15

No need for knees when
BENDING *

Save your energy! Use dead-soft DRYSEAL. You can make the most intricate bends with your fingers . . . no tools of any kind required. And its ductility and special temper make it extremely easy to flare for compression fittings without danger of splitting. To make sure you get a tube that is free of even the slightest trace of dirt or moisture we double crimp DRYSEAL on both ends, at the factory. This is the final step in manufacturing, immediately following a special cleaning and dehydrating operation, which keeps dirt and moisture from entering the tube. This double crimping does not interfere with installation for it is made in such a way that it permits DRYSEAL to be passed through any opening large enough for the tube itself. Tube sizes— $\frac{1}{4}$ " to $\frac{1}{2}$ " O.D. The DRYSEAL carton, attractively designed for easy identification, contains one 50-foot coil . . . is easier to handle, light weight, economical and sturdily made to assure protection of the tube in stock and in transit.

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COPPER AND BRASS INCORPORATED

Founded by Paul Revere in 1801
230 Park Avenue, New York 17, N. Y.

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Sales Offices in Principal Cities, Distributors Everywhere.

* **REVERE**
DRYSEAL
COPPER
REFRIGERATION
TUBE

Time Controls for Conditioners Described

—KEY NO. R-129—

MT. VERNON, N. Y.—A new bulletin, 511, titled "Air Conditioning Time Controls," recently was issued by Tork Clock Co., Inc. here.

Divided into two sections, the bulletin deals with commercial installation of installed type time switches, and window models (portable plug-in time switches). It tells what controls to use for any particular situation or type of air conditioner, the company declared.

Bulletin 511 lists the various dials available (plain dial for night shut down, "Skip-A-Day" for weekend omission, and "Seven Day" for varying daily schedule on the dial) as well as other pertinent data, the company said.

C&L Catalog Covers Pipes and Fittings

—KEY NO. R-1210—

MIDDLETOWN, Ohio — New C&L Lamneck catalog is now available covering air distribution pipes and fittings from Clayton & Lambert Mfg. Co., it was announced recently.

Utilizing a new format making it easier to use than any previous C&L fitting catalog, the publication is printed in two colors with each fitting fully illustrated, the manufacturer stated.

Other sections include information on types of systems, assemblies, and warm air heating, it was noted.

Catalog Describes Vibration Hangers

—KEY NO. R-1211—

HAWTHORNE, N. J.—A new line of high-deflection, heavy-duty vibration hangers, designed to prevent transmission of noise and vibration from suspended equipment and to flexibly support piping systems, is described in a catalog (VH-55) just issued by T. R. Finn & Co., Inc., specialists in shock and vibration control.

The catalog describes two types of vibration hangers. The rubber-in-shear type consists of a durable, bonded rubber-in-shear isolator spot-welded inside a steel housing, while the steel spring type consists of a helical steel spring enclosed in a steel housing.

Dimensions and specification, installation instructions, and Finn engineering services are also described. Rated load capacities range from 35 to 1,500 lbs. for the rubber-in-shear hanger, and from 50 to 1,000 lbs. for the steel spring hanger.

New Sprayed-Coil Dehumidifier Discussed

—KEY NO. R-1212—

DETROIT—Bulletin 7827, a 20-page, two-color illustrated catalog describing the new central station type sprayed-coil dehumidifier is now available from American Blower Corp. here, it was recently announced.

Featuring a 10-page section of application data which discusses pertinent factors on the selection and use of sprayed coil dehumidifier, the catalog also covers water dilution, high humidification, evaporative cooling, and selection for size, it was stated.

Also included in the special section is such data as symbols, formulas, and 12 tables and curves required for accurate selection of sprayed coil dehumidifiers. An example is included which shows step-by-step how to select a sprayed coil dehumidifier for a given hypothetical application. Solutions for both type W chilled

water coil unit and type X direct expansion coil unit are also given, the company continued.

The catalog outlines design and construction features of sprayed coil units, emphasizing such details as cooling coils, drain troughs, fresh water connections, spray nozzles, strainers, and overflow trap, it was said.

Dean Bulletin Lists Coil Data and Prices

—KEY NO. R-1213—

BROOKLYN — Thermo-Panel Div., Dean Products, Inc. recently put out a four-page bulletin on its coil data and prices, it was announced.

Bulletin 256 gives prices and tells how to make estimates, the firm said. Other things covered are methods of rolling or shaping Thermo-Panel coil, length and width variations, handles and hanger brackets, surface treat-

ment, zinc metallizing, edge sealing weld, how to make a closed cylinder, and half-couplings or pipe nipples.

The last page contains eight illustrations and gives further design information for replacing pipe coils, the company said.

Electric Radiant Wall Panel Illustrated

—KEY NO. R-1214—

PITTSBURGH—A four-page bulletin illustrating, in full-color, a new electric radiant wall panel with all-metal construction was announced recently by the Edwin L. Wiegand Co. here.

The heat radiating surface is an aluminum panel with a fully-enclosed type, tubular element bonded to its reverse side. Moisture cannot enter, there are no hot exposed wires, enclosed elements cannot cause shock and panel will not shatter or break, the company said.

Metals Booklet Relates Cooling, Heating Uses

—KEY NO. R-1215—

NEW YORK CITY—Uses of copper, brass, and aluminum as home building materials are presented in two colors in a 30-page booklet recently issued by Revere Copper & Brass, Inc. here, it was announced.

Many photographs and simplified detailed drawings of specific applications of these three metals are included in "Building to Endure with Revere," the manufacturer said.

Part of a 14-page section on copper deals with a radiant heating system, plumbing and vent stacks, and hot water storage tanks and heaters, it was reported.

The booklet explains construction terms, tells how to seal a house, and discusses heating and air conditioning using copper tube and sheet copper, the company said.

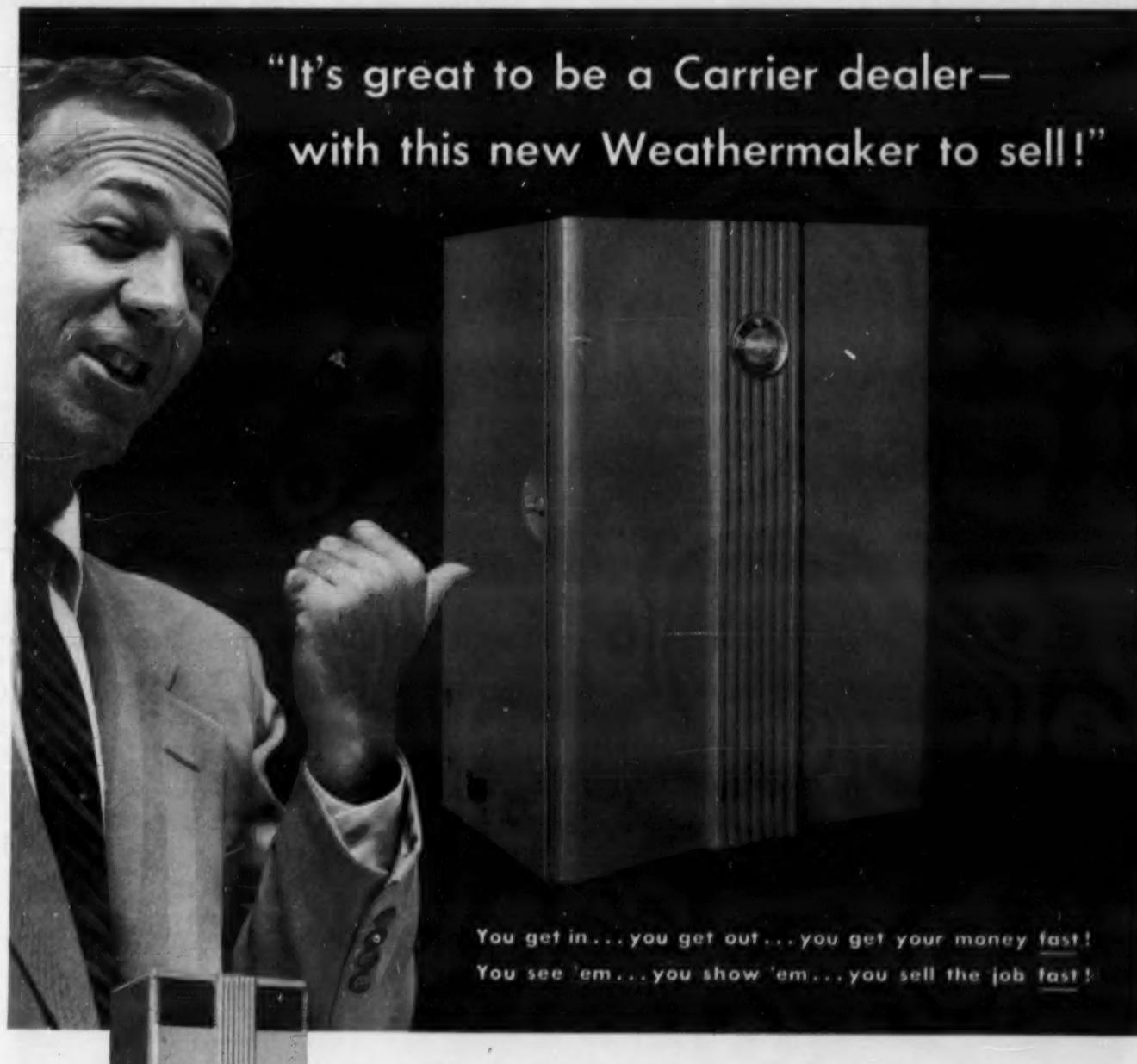
Anemostat Bulletin Explains 'Pushbutton'

—KEY NO. R-1216—

NEW YORK CITY—A new bulletin on the recently developed "Pushbutton" Anemotherm air meter has been announced by the Anemostat Corp. of America here in a statement.

The Anemotherm is a self-contained, portable unit for measuring air velocity, air temperature, and static pressure in heating, ventilating, and air conditioning systems. It may be used in ducts, free spaces, and at air inlets and outlets, the manufacturer reported.

The bulletin explains the operation of the Anemotherm and describes typical uses for it, in various types of systems. A number of photographs illustrate the time-saving and precision control features of the unit, and outline operating procedures, the company declared.



*You get in... you get out... you get your money fast!
You see 'em... you show 'em... you sell the job fast!*

This is it, man! A dream of an air conditioner! Looks like a million. Loaded with sales advantages. And designed for lower installation costs!

Take wiring, for example: Electrical center is pre-wired. You make connections at one outlet box on the side of the unit!

Alternate fan discharge: Invert fan platform for top or back air discharge. No cutting or patching of casing is required!

Built-in heating coil space: Coils can be installed right in the casing without alteration. They heat the same area cooled!

And look at the help you get from your Carrier distributor: Complete course in how to sell the Weathermaker... the industry's most complete line of water and air cooled self-contained equipment... Weathermaker Handbook for sure-fire selling... low-cost finance and stock-ordering plans... on-the-spot assistance in engineering, sales and advertising!

Write us today or check your phone book for the name of the distributor who will tell you in dollar-doubling detail how you can see 'em and show 'em and get your money fast! Carrier Corporation, Syracuse, New York.

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Refrigeration Problems And Their Solution

By Paul Reed

For Service and Installation Engineers



to damage the insulation, brush springs, or bearings.

So it is a matter of building a device that will delay opening long enough to allow the motor to start and get up to speed, and yet protect the motor against extra-long starting or sustained overloads.

ORDINARY FUSE UNSUITABLE FOR MOTOR PROTECTION

The ordinary fuse blows almost at once if it has to pass more current than its rating, so if it is big enough to allow the motor to start, it is 3 or 4 times too big to protect it against overload. There are such devices as time-delay fuses, such as fuseltrons and fusestats, that are effective in protecting single phase and direct current motors.

How much are these heavy starting currents while the motor is coming up to speed? For some high-starting torque drive compressors, that during

it is so heavily overloaded that it will burn out.

So whatever protective device we use for a motor must pass a very great deal of current without blowing, for the first few seconds while the motor is getting up to speed, but still be able to blow and stop the motor later if the current remains excessive long enough to cause the motor to overheat long enough in accord with motor heat.

Unlike lights, a motor draws a great deal more current when it is just starting and getting up to speed than it does when

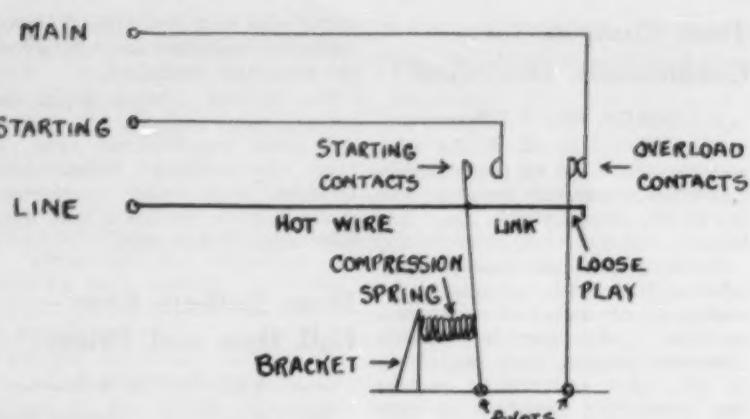


FIG. 1—Principle of hot wire relay in normal, running position with starting contacts open, and overload contacts closed. Loose play between link and overload arm requires more current to open overload contacts than starting contacts. Snap action is also incorporated in actual relay.

motors, suitable for driving a starting, draw much less than compressor that starts under three times the normal full load load, the current while the current while the motor is starting may be as some really heavy momentary much as 4½ times the normal full-load current. There are hardly any motors suitable to

Take, for example, the 1-hp. motor we spoke of last week. At full load, it will draw about 1,000 watts, and its manufacturer builds it to start and carry a 25% overload continuously, so, in reality, it is a 1½-hp. motor, although rated at only 1 hp. on the nameplate.

At 25% overload, we will assume that it draws 1,250 watts. If it is a single-phase, 230-volt motor, with a power factor of about 68%, its current at 25% will be about 8 amperes. At full load, without the 25% overload, the current would be about 6½ amperes, but the "normal," expected current representing 125% load will be about 8 amperes.

Anything greater than 25% overload would represent a dangerous overload that might damage the motor. How much more than 8 amperes this motor could draw for a sustained period, will depend on the design and how much "extra" the motor manufacturer feels that should be provided. It might be as much as 9 amperes, and it might be no more than 8 amperes.

The manufacturer of the condensing unit is probably best able to judge how much more than 125% of full load is safe. He is probably in the best position to fix the maximum current, above which would be unsafe, and his instructions should be followed.

For purposes of an example, let us assume that the protective device in the starter is designed and rated to stop the motor on a sustained current of 9 amperes which means that he has allowed 12½ above the 8 amperes "normal" current that represents a load of 125% of the 1 hp. rating on the nameplate.

230-VOLT 1-HP. 'LOCKED-ROTOR' CURRENT MAY BE 25 AMPERES

As soon as the switch closes to start the motor, current will flow into its windings. This current will be quite high—probably about four times the full-load current, that is about 25 amperes. This instantaneous current is called "locked rotor" current, for when the switch is turned on, the rotor is not in movement; it is "locked."

Locked rotor can occur at other times also: if, for example, the compressor sticks, or

(Continued on next page)



Permagum makes a perfect seal every time

Manufacturers and service men alike prefer the positive sealing action they get from Permagum. Used to seal inspection plates, pipe and conduit openings, refrigeration and display cases, Permagum eliminates the host of troubles which condensation can bring down on your head—from just plain heat loss to ruined insulation.

These men are using gray-white Permagum, which is odorless, never hardens, and can be painted over

immediately after application. Since it won't attack insulation, it is ideal for use around electric wiring, rubber or plastics. Brown Permagum is a heavy-duty sealer which will adhere to any dry surface and remain pliable from 0° to 350°. Both forms come in 2½ lb. and 55 lb. slugs, while gray-white Permagum is also available in 80 ft. rolls of ½" cords and 20 ft. rolls of ½" cords.

Your wholesaler has Permagum

—or write Refrigeration Division, VIRGINIA SMELTING CO., Dept. 63, West Norfolk, Va.

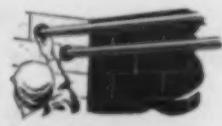
VIRGINIA
Chemicals

EBOTOO • KINETIC CHEMICAL'S "FREON" REFRIGERANTS
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SUNISO REFRIGERATION OILS

Available in Canada and many other countries



Won't attack electrical insulation.



Seals pipe openings permanently.



Perfect for refrigerator and display cases.

Heater Coils--

(Continued from preceding page) a rat gets into the belts (it happens). At those times the current is "locked rotor" current.

As the motor picks up speed, the current gradually goes down, until it becomes about normal. If the starting load is very heavy, the longer it will take for the motor to get up to speed and for the current down to normal—it may take less than $\frac{1}{2}$ minute, and it may take several minutes, depending on conditions.

LINE TYPE PROTECTORS MUST DELAY OPENING

Anyway, the protective device is going to have to delay opening for a reasonable time during starting, even though the starting currents are very heavy. If the load is just too much for the motor to start, the motor may stall, that is, not "turn over" at all. Then the locked rotor current of 25 amperes may persist, and the motor insulation could be damaged in less than a minute. So it is up to the protector to open and cut off the current in 30 seconds or less.

The protective device must act fast—30 seconds or less—on locked rotor currents or other very heavy currents, and yet act slowly on currents that are only slightly more than normal running currents. For this reason, the protective device is often called an "inverse time element, thermal overload protector," meaning that the length of time before it trips varies inversely as the heat developed by the over-current. That is, the higher the current or the higher the motor temperature, the shorter the time it takes for the protector to open.

And yet, a line type protector must do this simply on the basis of the amount of current flow in the line, away from the motor, for, unlike the "built-in" protector, the line type protector is directly influenced by the temperature of the motor, so must depend on line current only.

The line type protector may be a separate device, sometimes called "an overload relay" in a separate case. It may be, and often is, combined with a manual "off-on" motor starting switch. It is often combined with

the automatic starting switch, which is usually referred to as a "starting relay," and which closes the circuit to the auxiliary starting winding of a split-phase or capacitor start single-phase motor, during the starting period but disconnects the starting winding when the motor gets up to about two thirds of full speed.

HOT-WIRE COMBINED LINE TYPE PROTECTOR AND STARTING RELAY

The Delco "hot-wire" relay is a combination starting relay and line type protector that very ingeniously uses a piece of taut wire through which the main wire passes to the motor.

Two sets of contacts are connected to this wire. When the motor is off, no current flows through the wire. It is therefore cold and contracted, and the two sets of contacts are held closed by the pull of the wire.

When the current to the motor is turned on, the current passing through the wire heats it somewhat, causing it to lengthen. This allows a spring to pull the first set of contacts open, thus opening the starting winding.

As long as the current to the motor remains normal, the second set of contacts in the main line remain closed. If, due to overload or under-voltage, the main current becomes so great that the motor is dangerously overheated, the hot wire is further heated and further lengthened. This allows the spring to pull the second set of contacts open, thus stopping the motor.

With the current off, the hot wire cools quickly, contracts and overcomes the spring, and closes first main set of contacts, and then the set of contacts to the starting windings, again starting the motor. If, however, the overload or under-voltage persists, the hot wire again stops the motor. Thus, this device is the "automatic reset" type, although it could be designed for manual reset by adding a small ratchet.

In the larger sizes of motors, particularly three-phase motors, the overload protectors are incorporated in the magnetic starters. These will be described next week.

(To Be Continued)

Williamson Line--

(Concluded from Page 1) tion-cooled which eliminates the need for mounting in the air stream produced by the fan. As a result, the finned coil section is positioned above the compressor, it was stated. The air stream developed by the fan is used only to condense the refrigerant.

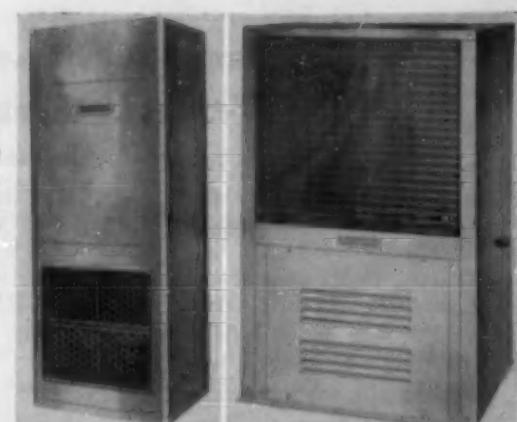
The design change permits mounting the finned coil off the ground. Danger of clogging the fins by indrawn dirt, leaves, or other material is eliminated, according to the company.

A condensate drain, mounted between compressor and finned coil catches moisture condensed on the coil and drains away rain or melted snow. The compressor is kept dry in its louver-ventilated lower compartment, the company said.

Over-all height has been increased. The exterior has straight lines with no overhanging roof and louvers. Units are finished in baked silver green which blends with shrubbery.

Furnace lines have been reclassified with new names and

CONSOLE-TYPE "Weathermatic" air conditioning unit of the 1956 Williamson Co. line is shown at near right. Its cabinet can contain either 2, 3, or 5-ton types. At right is a new Williamson suction-cooled outdoor compressor assembly.



color styling added, the report weather, according to the manufacturer.

The new Deluxe line also includes both gas and oil-fired furnaces, which were formerly known as "Oil Flo-Warm" and "Gas Flo-Warm." They employ either a Williamson oil burner guaranteed for five years, or a multi-jet gas burner, it was stated.

They are finished in two-tone silver green.

A separate group of single port gas-fired furnaces and another of oil-fired furnaces finished in silver green, each with three-year guarantee burners, are now included in the Super line, the company said.

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NOW A MODERN GAS-FIRED FURNACE WITH
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SAVE TIME—LABOR—MONEY

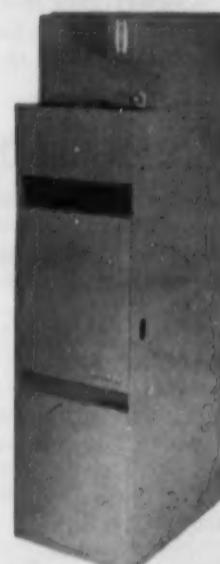
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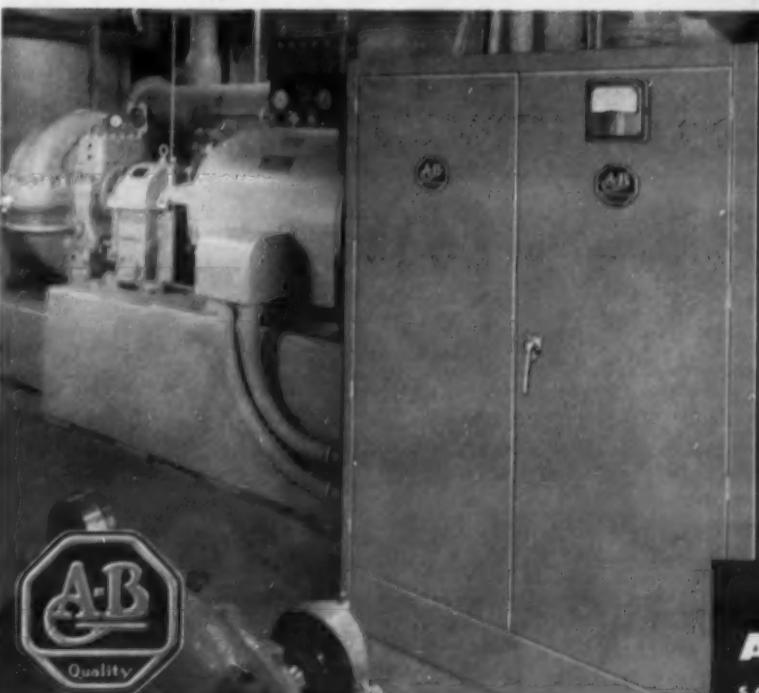
FRASER & JOHNSTON CO.
AIR-CONDITIONING DIVISION

1900 17TH ST.
SAN FRANCISCO, CALIF.



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Complete defrosting is automatically done with electrically heated air circulated within the unit while the door is closed. Sufficient heat is immediately available at all times regardless of amount of ice accumulation. Krack engineered for many years of dependable performance.

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Bulletin 746 Magnetic Transformer-type Starter. Max ratings: 300 hp, 220 v; 600 hp, 440-550 v. Available also as a manually operated starter.

For more information about products advertised on this page use Information Center, page 26.

Servicing Automobile Air Conditioners

BY C. DALE MERICLE

This is the first instalment describing the air conditioning system employed by American Motors Corp. in its Nash automobiles.

Makes previously discussed in this series, which began in the June 13 issue, have included A.R.A., Frigikar, Automotive Air Conditioning, Pivot, Novi, Oldsmobile, Buick, Pontiac, Chevrolet, and Ford.



FIG. 1—Shows general arrangement of major components in 1954 Nash air conditioner. The 1955 system is essentially the same.

NASH (1)

American Motors Corp.
14250 Plymouth Rd.
Detroit 32, Mich.

DESCRIPTION

The Nash "All Weather Eye" air conditioning system is of the "front-end" type design.

Compressor is driven by the car engine through a magnetic clutch. Condenser mounts in front of the car radiator. Evaporator is mounted on the firewall in the dash compartment and delivers conditioned air to the passenger compartment through outlet grilles on the instrument panel.

The same air distribution system is employed for both heating and cooling. Refrigerant used is "Freon-12," the complete charge being 4 lbs. in the 1954 and 1955 "Ambassador" and "Statesman" series, 3½ lbs. in the 1955 "Rambler."

Major components of the 1954 Nash air conditioning system are shown in Fig. 1. Their location is essentially the same in 1955 models.

Compressor

Nash uses a two-cylinder, reciprocating compressor mounted on the side of the engine. It is driven through a magnetic clutch.

Discharge and suction service

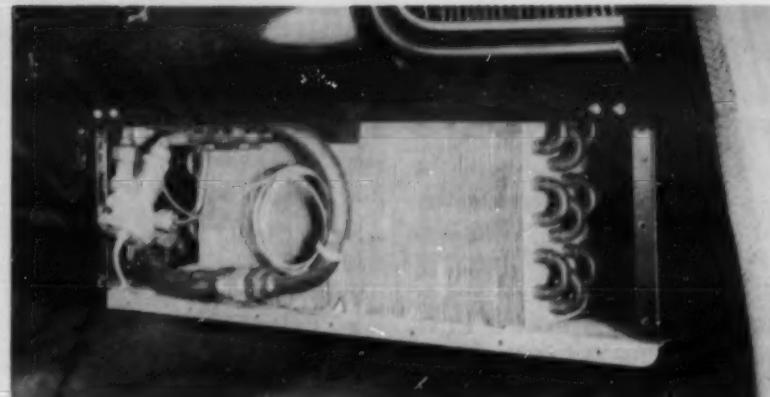


FIG. 2—Evaporator is under dash on right side, as this view of 1954 model with cover removed shows.

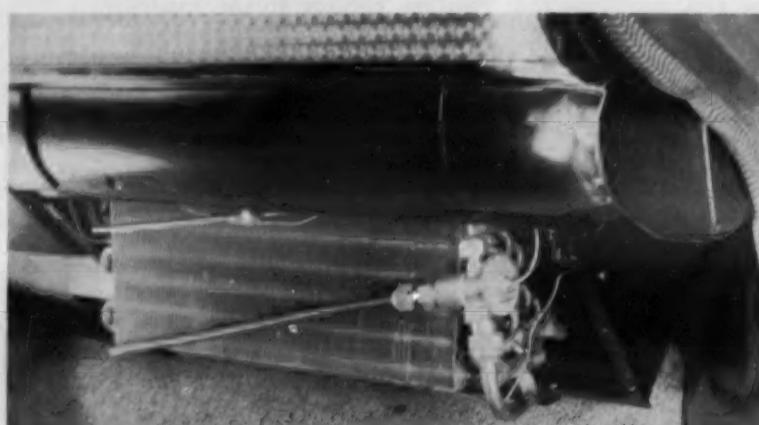


FIG. 3—Modifications were made in 1955 evaporator arrangement.

valves are located on each side of the compressor. The discharge service valve is on the left side of the compressor, the suction service valve on the right side.

Suction side of the compressor is further identified by the word "Suction" cast in the cylinder head.

Condenser

Condenser of the Nash air conditioning system is located ahead of the radiator and is mounted on the radiator air baffles. Inlet to condenser is at the upper right corner while the outlet is at the lower right corner.

Receiver is located to the right of the condenser. A fusible plug is provided in the condenser inlet. The fusible plug is designed to discharge at a tem-

perature of 367° F.

Between the condenser and receiver a check valve is provided.

A filter, followed directly by a sight glass, is provided in the liquid line in the engine compartment.

No dehydrator is used in the Nash system. Instead, 2 c.c. of methanol are charged into the system for each pound of refrigerant, or a total of 8 c.c. The methanol is intended to prevent freeze-ups if moisture is present in the system.

A heat exchanger between the liquid and suction lines is provided in the 1955 Rambler.

Evaporator

Evaporator of the Nash system is located in a housing on the right-hand dash panel at the heater opening (see Figs. 2 and 3) except in the 1955 Rambler, where the evaporator housing is in the center of the dash panel.

Also in the evaporator housing is the thermostatic expansion valve. The latter has an external equalizer line connected into the suction line ahead of the point where the bulb of the expansion valve is attached.

Air is drawn into the evaporator housing from the passenger compartment through the heater and return air duct by two blowers on 1954 systems. One blower is located directly

over the evaporator core, and the other is at the left-hand side of the dash, being connected to the evaporator housing by a duct.

Each of the blower fans is encased in a separate housing. At high speed, the blowers can deliver approximately 250 c.f.m. at the outlet grilles.

A single blower is used on 1955 systems, being located on the right side of the evaporator-heater assembly housing.

Fresh "ram" air admitted to the evaporator from the cowl vent is combined with return air passing over the evaporator coil. Around 25% to 30% fresh air is brought in during the cooling cycle.

(To Be Continued)

Servel Lines Being Introduced at Regional Meetings

EVANSVILLE, Ind.—Dates for unveiling new Servel appliance models to distributors and utility companies in five U. S. regions were announced by Richard S. Testut, vice president and general manager of the home appliance sales division.

The company's 1957 gas and electric refrigerator lines, its 1956 room air conditioner line, and its portable "Wonderbar" refrigerette will be exhibited at a series of two-day product-introduction meetings. The first meeting was held 6-7 in Chicago's Edgewater Beach hotel.

Testut pointed out that the development of engineering and design improvement ahead of schedule will enable the company to make its 1957 refrigerator models available to customers this spring.

The remainder of the Servel conferences schedule follows:

Jan. 16-17—Barbizon Plaza, New York City; Jan. 25-26—Ambassador hotel, Los Angeles; Jan. 30-31—Melrose hotel, Dallas, Texas; Feb. 3-4—Tutwiler hotel, Birmingham, Ala.

In Chicago, New York City, Los Angeles, and Birmingham, the utility presentation will take place on the first day and the distributor presentation on the second. In Dallas, the schedule will be reversed.

Ansul Profit Up 32% For Year on Record Sales of \$12,690,157

MARINETTE, Wis.—Reporting a 32% profit increase for the fiscal year ending Oct. 31, Ansul Chemical Co. here announced largest sales in its history—\$12,690,157.

Net earnings were \$449,145 last year compared with \$339,406 from \$12,618,025 in sales in 1954.

A dividend of 36 cents a share was declared for the fourth quarter by Ansul.

Trion Names Nuernberg

PITTSBURGH—Trion, Inc., manufacturer of electronic air cleaners, has elected William W. Nuernberg treasurer to succeed N. F. Eichelsbacher who has been named vice president in charge of manufacturing.

Harry Alter's Newest DEPENDABOOK No. 163
Over 10,000 (count 'em!) items, shown and priced:
REFRIGERATION PARTS and Supplies
Also Electric Motors and Parts and Air Conditioning
WHOLESALE ONLY
Write for your copy and save money

The HARRY ALTER CO., Inc.

Quick installation, quick profit...

Ranco's new control for new ice bank milk coolers gives you both!

Here's a new control that fits right the first time . . . and offers better ice bank regulation than any other milk cooler control on the market.

Location of the control bulb determines the size of the ice bank. Control has 72" capillary tube, $\frac{1}{16}$ " diameter bulb and a strip clamp. Single-pole, single-throw switch opens on temperature drop at 32°F, recloses at temperatures slightly over 32°.

Other Ranco milk cooler controls simplify your replacement job, too. Models 010-1477, 010-1414 and 010-1829 are efficiently adaptable to either waterspray or ice bank coolers, can be installed quickly.

Ranco Replacement Reference No. 1544 describes nearly 5,000 additional Ranco refrigeration and air conditioning controls—each tailored to a specific job. Purchase your copy from your Ranco wholesaler today (not available from the factory).



Exact replacement
018-100 Ice Bank Control





LEFT: "Master" combination 1956 Philco 9-cu. ft. fully automatic self-defrosting refrigerator and 6.8-cu. ft. freezer is this model L-1668. RIGHT: Twin of a Custom Sectional freezer is this Custom Sectional refrigerator showing dairy bar in door, sliding door butter keeper, and cheese keeper.



1956 Philco Custom Line--

(Concluded from Page 1, Col. 4)
and a wheel kit for refrigerators.

The refrigerator and freezer in the Custom Sectional appliance line are of identical exterior size and design. Each has its own refrigeration system. They can be placed side by side on standard kitchen cabinets, or beneath a work surface; they can be mounted on top of each other, or remotely located.

The doors, available in white or brushed chrome, can be mounted for either left or right-hand opening. The white finished door can be repainted at any time, in any color to match kitchen color changes.

Sectional Refrigerator Is 8.2-cu. ft. Unit

The Custom Sectional refrigerator is an 8.2-cu. ft. unit. Refrigeration is maintained with a vertical plate.

The storage compartment has two "Visa" crispers, two full-width and two half-width shelves, and a new dome type interior floodlight. The anodized aluminum shelves are "Shell-tone" color. The "Dairy Bar" in the door has sliding door cheese keeper and butter keeper, egg and bottle racks.

The Custom Sectional freezer is 6.8 cu. ft. in capacity and has two slide-out, drop-front storage baskets. Door storage has five juice or soup can dispensers and two storage baskets. The ice cube shelf is equipped with six trays, including two "ice-slice" trays that make ice-wafers."

Dimensions of each Custom Sectional refrigerator and freezer are: 33½ in. wide; 28 in. deep, 34½ in. high. Base cabinets and work surface tops for dual or single installation are available.

The "elevator" oven automatically elevates itself at the touch of a switch to the proper working height for the person using it. The banquet size oven is in a 24-in. wide, 24-in. deep, and 36-in. high base cabinet with a top work-surface.

When food is cooking, the oven may be lowered into the base cabinet, freeing the top for work-surface use.

A wall-mounted control center which makes the oven completely automatic is available as an accessory. The control center includes the Philco "Roastmeter" which electrically records degree of doneness of meats, a "Quickset" timer-clock that requires only two settings—cooking time and finish time, and an electric interval timer.

Cabinet Surface Units Are New Square Design

The surface units in a matching base cabinet are of the new square design and are mounted in a brushed stainless steel top. The two-door cabinet below the surface units has ample storage space for pots and pans.

A 48-in. electric sink is introduced for the first time by Philco. It includes a front-opening, top-loading dishwasher, and a food-waste disposer. The dishwasher is also available as a

24-in. model, or as an under-counter model. The food-waste disposer is also available as a separate item. The electric sink and 24-in. dishwasher models have custom finished tops.

The new built-in Custom oven will be equipped with Philco's exclusive "Broil-Under-Glass" smokeless broiler.

A master combination refrigerator and freezer with a total capacity of 15.8 cu. ft. highlights the refrigerator-freezer line for 1956. The master combination has a 9-cu. ft. refrigerator and a 6.8-cu. ft. freezer. They have the same features as the Custom Sectional refrigerator and freezer.

A 13.7-cu. ft. two-door refrigerator-freezer with a 4-cu. ft. freezer is the largest capacity model of five two-door refrigerator-freezers.

Philco also will have a 10.5-cu. ft. two-way opening door refrigerator-freezer for 1956.

It will have six single door refrigerators in the new line, ranging in capacity from 12.6 to 7.3 cu. ft.

2 Upright Freezers

Two new upright freezers with dispenser shelves in the doors for frozen juice and soup cans and packages have been introduced for 1956. They are available in 20.4 and 14.6-cu. ft. capacities. They are equipped with battery operated, audible alarm systems.

Philco's convertible chest-type freezers will be available in two capacities, 18 and 13 cu. ft. The fast freeze compartment in these models can be used three ways: fast freezing, zero storage, or as a refrigerator with temperatures at 38 to 42°.

"Operation of the convertible fast freeze compartment in any of the three cold zones has no effect on the storage compartment temperature which remains at zero or below," the company said.

There will be 11 freezer models in Philco's line, four uprights and seven chest types.

A "do-it-yourself" central air conditioning kit for use with a new 2-hp. room air conditioner

designed for remote installation will be offered in 1956 by Philco.

Handyman Can Install Central Unit

With the central air conditioning kit, the company claims, a competent handyman can install the unit. Instructions for installation are simple, Philco said.

Even when installed with contract labor, the cost is claimed to be well below comparable conventional central air conditioning systems.

In 1956, Philco will have room air conditioners that have automatic temperature control for both heating and cooling. The control will switch the unit automatically to heating or cooling, whichever is needed.

Other features include keyboard controls mounted outside the control panel for easy access. The keys include most used controls such as "off," "on," "cool," "heat," and "automatic."

Philco's "Odor Stop" activated

charcoal filter which absorbs odors before circulating the air in the room will be standard equipment on many models and available for all of them.

Fourteen new air conditioners are available for 1956, ranging in capacity from $\frac{1}{2}$ to 2 hp. The "Windowlette" console-type air conditioner "which meets all installation problems" will be available in $\frac{3}{4}$ and 1-hp. models.

Warm Air Furnaces --

(Concluded from Page 1, Col. 5)
production: 1) more and more home buyers are rejecting space heaters, especially in the south and far west; 2) rising demand for air conditioning puts a premium on using air ducts for heating too.

The trend to air conditioning is also boosting sales even in new houses sold without air conditioning equipment, Boedderer says, because many buyers want an air system so they can easily add the cooling unit.

Your Sales are the payoff

AUTOMATIC KUBER

AND LA CROSSE GIVES YOU MORE OF EVERYTHING YOUR CUSTOMERS WANT MOST IN COMMERCIAL REFRIGERATION EQUIPMENT

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THE LINE THAT'S PROFIT DESIGNED FOR YOU

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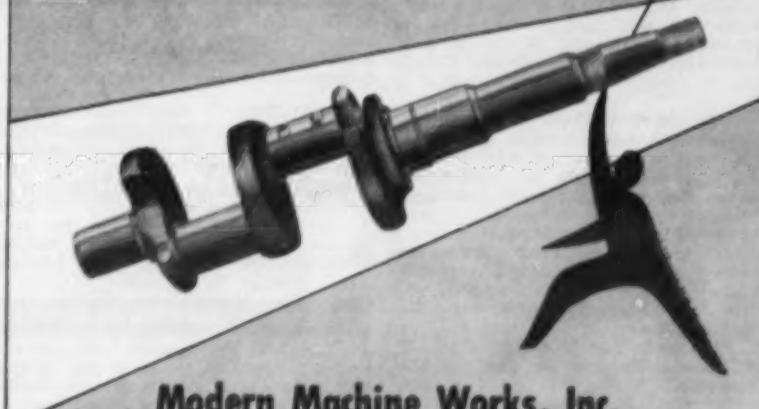
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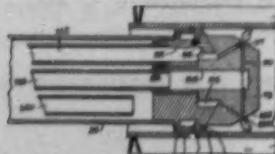
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PATENTS

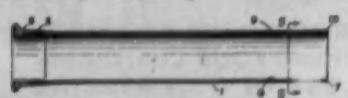
Week of Aug. 30
(Concluded)

2,716,276. METHOD OF BONDING FINE TO TUBES. John W. Brown, Jr., Lakewood, Ohio, assignor to Brown Printube Co., Elyria, Ohio.



1. The method of progressively bonding a longitudinally extending metallic fin member to the exterior of a metal tube by means of a bonding metal having a melting temperature lower than the melting temperature of the fin member and tube comprising the steps of bringing together the fin member and tube, supplying the bonding metal to the surfaces of fin member and tube that are to be joined together, engaging the fin member by guide means and thereby holding the fin member against the tube, continuously axially moving the assembly of tube and fine member with respect to said guide means, internally heating each annular increment of said tube to a temperature sufficient to melt said bonding metal by moving said assembly through a heating zone, and thereafter cooling each such annular increment to solidify said bonding metal, said heating and cooling taking place in the zone in which said fin member is held against said tube by said guide means.

2,716,422. LEAK STOPPER FOR CONDENSER TUBES. Samuel Pannella, Pompton Lakes, N. J. Application March 3, 1953, Serial No. 340,122. 1 Claims. (Cl. 138—97.)

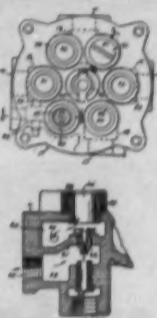


Means for stopping leaks in a perforated tube of a surface condenser comprising a tubular insert, said insert tapering to a knife edge at its outlet end and flared slightly on a

uniformly increasing diameter from a predetermined point inwardly of its inlet to its inlet end, an inlet head member including a sleeve portion inserted into the flared inlet end portion of the tubular insert and having a reduced outside diameter to receive the flared inlet end portion of the insert whereby the outer surface of the insert will lie flush with the outer surface of the inlet head member, said inlet head member having an enlarged inlet end for engagement with a condenser tube sheet, said tubular insert has a portion of its outer surface cut away for a predetermined distance inwardly of its outer end, and a sleeve of material which will swell when wetted seated in said cut away portion and having its outer surface flush with the outer surface of the tubular insert.

REISSUES

24,055. MULTIPLE PORT VALVE. Leo G. Daniels, Rockford, Ill. Original No. 2,605,902, dated Aug. 5, 1952, Serial No. 639,920. Jan. 9, 1946. Application for reissue October 22, 1954, Serial No. 465,708. 11 Claims. (Cl. 210—24.)

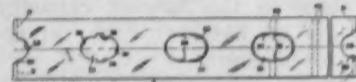


1. A valve comprising a body having a top chamber, a bottom chamber, two side chambers [and an injector chamber], each of said chambers being provided with an opening for connection with a pipe, and an injector chamber, said body having a face provided with ports arranged 60° from an adjacent port, each of said ports communicating with at least one of said chambers, said body also having a reagent chamber provided with an inlet [a pipe] connection, [and] a passage of smaller cross-sectional area than said ports connecting said injector chamber with said top chamber, an injector nozzle disposed between said injector chamber and said reagent chamber to deliver water from the injector chamber into a discharge connection from the

reagent chamber [into the pipe connection of the reagent chamber] and thereby withdraw reagent from the latter, a valve plate arranged in confronting relation to said face of said body, a cover secured to said body and enclosing said valve plate, means for introducing fluid under pressure into said cover, means on said valve plate providing enclosed transfer passage means, and valve plate having through port means extending completely therethrough, open ports extending into said transfer passage means, and blind portion means, the ports of said body and valve plate being formed upon substantially equal radii, said valve plate being movable into a plurality of operative positions including a first position in which said open through port means establishes communication between the interior of said cover and said top chamber, said transfer passage means interconnects said bottom chamber and one of said side chambers and said blind portion means closes communication to the other of said side chambers, and another position in which said open through port means establishes communication between the interior of said cover and said injector chamber to deliver water to the injector chamber for the passage to the nozzle and the top chamber [the top chamber and to the nozzle], said transfer passage means interconnects said bottom chamber and the other of said side chamber and said blind portion means closes a port communicating with said top chamber.

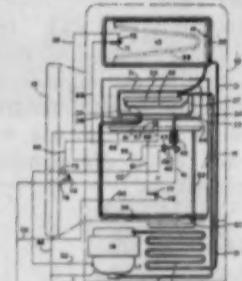
Week of Sept. 6

2,716,802. METHOD OF MAKING HEAT EXCHANGE DEVICES. Carl S. Greer, Jr., Albion, Mich., assignor to Tranter Mfg. Inc., a corporation of Michigan. Original application Oct. 8, 1951, Serial No. 250,273. Divided and this application Oct. 20, 1952, Serial No. 315,723. 2 Claims. (Cl. 23—157.3.)



1. The method of forming a heat exchange unit having a tube and having fins applied to said tube, which comprises forming an elongated flat strip with longitudinally spaced aligned openings elongated in the direction of length of the strip and spaced inwardly from opposite side edges of said strip, notching the strip at opposite sides of the openings and midway between the ends of said openings to provide the openings with aligned extensions, bending the portions of the strip defining the marginal edges of each opening at opposite sides of the extensions laterally outwardly to provide flanges extending at right angles to the strip and having a width less than the depth of the extensions, folding the strip in a laterally inward direction along longitudinally spaced lines located between adjacent openings, folding the strip in a laterally outward direction along longitudinally spaced lines which respectively coincide with opposite side edges of the extensions and which extend in parallel relation to the lines along which said strip is bent in a laterally inward direction to form longitudinally spaced corrugations with aligned open recesses in opposite side walls of each corrugation and to position the flanges in alignment to provide extended bearing surfaces bordering the recesses, positioning a length of tubing in seating engagement with the bearing surfaces formed by said flanges.

2,716,865. REFRIGERATING APPARATUS. Carl A. Stickel, Dayton, Ohio, assignor to General Motors Corp., Dayton, Ohio.



5. A refrigerating apparatus comprising in combination, a cabinet having an unfrozen food storage compartment and a frozen food storage compartment therein, said compartments being insulated from one another and isolated against flow of air therebetween, a closed refrigerating system associated with said cabinet, said system including an evaporator for cooling said frozen food compartment, another evaporator for cooling said unfrozen food compartment and a motor and compressor driven thereby for circulating refrigerant through the evaporators in succession for producing differential temperatures within said compartments, electric means for heating said unfrozen food compartment evaporator to remove frost and ice therefrom, an electric circuit for said motor and said heating means, said

Government Contracts

U. S. POST OFFICE DEPARTMENT

Office of Small Business, International Cooperation Administration, 815 Connecticut Ave., NW, Washington 25, D. C.
DRINKING WATER COOLERS. 20 ea.—IFB ICA/SCB No 55-120 (Item 3)—Bid Opening 2-4-56—Submit Bids Brussels, Belgium.
EQUIPMENT FOR PRODUCTION OF DRINKING WATER BY CHLORINATING PROCESS. Chlorination of condenser Cooling Water—IFB ICA/SCB No. 55-120 (Item 11)—Bid Opening 1-28-56—Submit Bids Brussels, Belgium.

SYNOPSIS of PROPOSED SALES of SURPLUS PROPERTY

U. S. Naval Supply Depot, Clearfield, Building D-12, Disposal Division, Ogden, Utah, E. M. Shenk, Lt. SC, USN, Disposal Officer.
Heating and Ventilating Material: Fans, Ejector, Glass tubing, Coil, cooling—Total Estimated Acquisition Cost \$49,553—Invitation No. B-180-56—Bid Opening 11 Jan 56—Sealed Bid, address above—Property may be inspected located above.

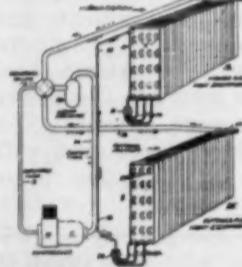
circuit including a thermostatic means responsive to the temperature of said frozen food compartment for energizing and deenergizing said heating means, another thermostatic means responsive to a near freezing temperature of air in said unfrozen food compartment for also energizing and deenergizing said heating means independently of said first named thermostatic means, and a thermostatically operated snap switch responsive to the temperature of said unfrozen food compartment evaporator for starting and stopping said motor, said snap switch being interposed in the circuit leading to said heating means and deenergizing said heating means when said motor is started irrespective of the position of said first named thermostatic means.

2,716,866. WATER HEATING SYSTEM OF THE HEAT PUMP TYPE. William Charles Silva, Chicago, Ill., assignor to General Electric Co.



1. An ice making machine adapted to produce dry flake ice without the use of relatively moving water-carrying pipe parts comprising in combination: a vertical drum defining a cylindrical ice forming surface, an annular header non-rotatably disposed above the drum and in registry with the surface, the header having a series of water outlets positioned above the drum to cause circumferentially uniform water flow onto the surface, a rotor within the drum and adapted to rotate about the axis thereof, the rotor having a series of vertically spaced ice cutting knives mounted to engage the ice on the drum as the rotor turns, and a shield mounted for rotation in unison with the rotor and above the knives to interrupt the flow of water to the drum in advance of the knives to permit the water to form dry ice for engagement by the knives.

2,716,870. REVERSE CYCLE HEAT PUMP SYSTEM. Gerald L. Biehn, Needham, Mass., assignor to Westinghouse Electric Corp., East Pittsburgh.



1. A heat pump system comprising a first indoor air heat exchanger, a second indoor air heat exchanger located adjacent and downstream with respect to the flow of indoor air of said first exchanger, an outdoor air heat exchanger, a refrigerant compressor, a reversal valve, means including suction and discharge tubes connecting said valve to said compressor, first refrigerant flow means connecting said outdoor and first indoor exchangers, second refrigerant flow means connecting said valve and second exchanger, third refrigerant flow means connecting said valve and said outdoor exchanger, and fourth refrigerant flow means connecting said first and second exchangers, said valve during air cooling operation supplying refrigerant through said third flow means to said outdoor exchanger from which the refrigerant flows through said first flow means to said first indoor exchanger, from which the refrigerant flows through said fourth flow means to said second indoor exchanger from which the refrigerant flows through said second flow means back to said valve, said valve during air heating operation supplying refrigerant through said second flow means to said second indoor exchanger from which the refrigerant flows through said fourth flow means to said first indoor exchanger from which the refrigerant flows through said third flow means back to said valve.

(To Be Continued)

CLASSIFIED ADVERTISING

RATES for "Positions Wanted" \$7.50 per insertion. Limit 50 words. 15¢ per word over 50.

RATES for all other classifications \$10.00 per insertion. Limit 50 words. 20¢ per word over 50.

ADVERTISEMENTS set in usual classified style. Box addresses count as five words, other address by actual word count. Please send payment with order.

POSITIONS WANTED

EXPERIENCED SALESMAN wants new product requiring small capital investment to distribute to dealers in fast-developing Southern Arizona territory. Has extensive contacts in automotive and retail trade in this area. If you want aggressive representation in booming air conditioning market, write BOX A5307, Air Conditioning & Refrigeration News.

POSITIONS AVAILABLE

SALES ENGINEER, with York distributor, Tucson, Arizona. Will give good proposition to man with good experience in selling refrigeration and air conditioning equipment. Must be able to start to work by February 1st or sooner. SOUTHERN ARIZONA YORK REFRIGERATION CO., 4468 East Speedway, Tucson, Arizona.

MANUFACTURERS' REPRESENTATIVE with commercial refrigeration experience, now covering Michigan, Indiana, Midwestern or Southwestern states, to sell fast-growing line of commercial equipment. Write PAUL R. STEWART, 1713 John Street, Cincinnati 14, Ohio.

YORK CORPORATION distributors in California, Arizona, Nevada, seek qualified sales personnel to add to their rapidly-growing firms. All jobs in key cities. Sales emphasis on packaged, residential air conditioners, condensing units. Excellent opportunity. Salary and/or commission. Send resume, including training, experience, present position, income level, snapshot if possible. Replies strictly confidential. State any preference of location. Mail to R. P. Jones, YORK CORPORATION, 5051 Santa Fe Avenue, Los Angeles, California.

FACTORY BRANCH location in Chicago has openings in service department for appliance servicemen and one or two supervisors. Best working conditions. Please submit brief outline.

of experience to BOX A5416, Air Conditioning & Refrigeration News.

ENGINEERING GRADUATE with a background of refrigeration experience, capable of handling a project from development into production. Opportunity for man of proven ability to grow with expanding Midwest manufacturer of refrigeration and accessory equipment. Preferred age, 30-35 with a minimum of five years' experience in refrigeration equipment design. Our employees know of this ad. Write BOX A5417, Air Conditioning & Refrigeration News.

PRODUCT DEVELOPMENT engineer wanted by established Midwestern manufacturer of refrigeration and industrial valves and accessories. Engineering degree desirable but not required. However, a knowledge of hydraulics and thermodynamics is important. Excellent working conditions and benefits. Salary open. Applicant should state education, experience and salary desired. BOX A5418, Air Conditioning & Refrigeration News.

TERRITORY AND city salesmen needed by Southwest refrigeration and heating supply wholesaler—excellent territory—drawing account and commission—Splendid opportunity for man willing to make sufficient calls—Write BOX A5420, Air Conditioning & Refrigeration News, giving full experience and qualifications.

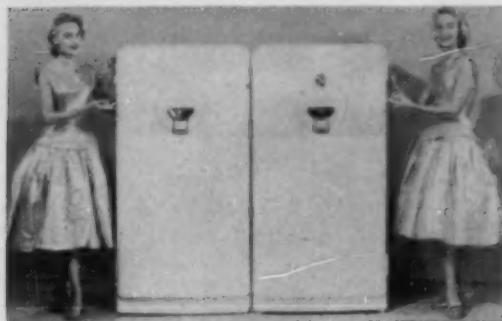
EQUIPMENT FOR SALE

NEW AJAX Electric Iceman parts available under factory list. Write **AJAX PHILADELPHIA, INC.**, 3617 Lancaster Avenue, Philadelphia 4, Pa.

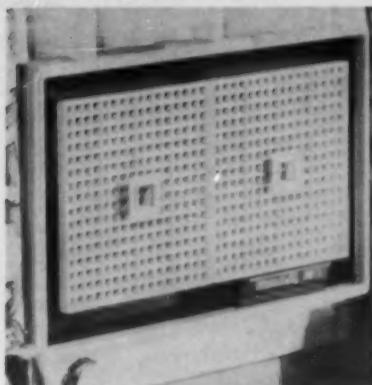
AUTOMOTIVE AIR conditioning blowback assembly: Welded pressed steel housing, rubber mounted for smooth quiet operation. 4" air inlet 3" air discharge. 6 volt d.c. motor 1600 r.p.m. 150 c.f.m. 9" H x 8" W x 3 1/2" D. \$6.95 ea. Lots of ten \$65.00. Send for free circulars on refrigeration values. **WALTER W. STARR**, 2833 Lincoln Ave., Chicago 18, Illinois.

BUSINESS OPPORTUNITIES

FOR SALE: Commercial refrigeration and air conditioning sales and service business in a Michigan area of 150,000 population. Oldest established service business in area. Parts, inventory and two trucks. National sales franchises. Low overhead. Unlimited sales and service opportunity. Write BOX A5419, Air Conditioning & Refrigeration News.



PICTURED at left are "Shelvador Twins," a 1956 Crosley upright freezer matched by a refrigerator with no freezer compartment. The two have a combined fresh and frozen storage capacity of 28 cu. ft. The refrigerator has a new high speed electric automatic defrosting system.



THIS new Crosley "Power Miser 75" room air conditioner draws $7\frac{1}{2}$ amps off 110 v. It can be moved from room to room and plugged into any outlet. The model is one of five in the 1956 line, including a casement unit.

'56 Crosley Line--

(Concluded from Page 1)

windows. Each is equipped with disposable filter, thermostat, pushbutton controls, and adjustable grille to channel air flow in any of four directions.

The new electric defrost system on the refrigerators, Crosley engineers said, applies current simultaneously to all areas where frost accumulates, including the freezer compartment and the baffle separating it from the refrigerator section.

The new system, they said, is made possible through the use of roll-bond aluminum evaporators. It is claimed to be 30 to 50% faster than hot gas defrost.

The two "freezerless" models, one 11 cu. ft. and the other 13.4 cu. ft., are designed to offer the housewife, with their matching freezers, 22 and 28 cu. ft. of fresh and frozen storage respectively.

A "Duo-Shelvador" model has

a 130-lb. freezer at the bottom of the unit and 9.2 cu. ft. of fresh storage at the top. All of the shelves, the meat drawer, freezer drawers, and crisper roll out. In addition to the new electric defrost system, this model features the Crosley beverage server.

The balance of the line provides 15% frozen storage.

Styling innovations by Designer Mel Boldt of Chicago include a new push-pull crescent-shaped latch on all top model refrigerators and three upright freezers. Small models have a pushbutton latch.

"Copper-Glo" interior color styling has been carried throughout the line. Every model has a full width freezer, recessed door shelves, meat drawer, and vegetable crisper.

In addition to the three upright freezers in 11 and 13.5-cu. ft. capacities, Crosley is also offering 15 and 20-cu. ft. chests.

Left-hand doors are offered in both lines at no extra charge.

Suggested list prices follow:

REFRIGERATORS		
Model	Capacity (Cu. Ft.)	Suggested List Price
SH-85	8.3	\$199.95
DH-85	8.0	229.95
SH-105	10.3	289.95
DAH-105	10.3	369.95
CAH-130	12.5	449.95
RFH-130	12.8	549.95
RH-11	11.0	369.95
RH-14	13.4	469.95
FREEZERS (Upright)		
DH-11U	11.0	399.95
SH-14U	13.5	449.95
CH-14U	13.5	469.95
(Chest)		
CH-15C	15.0	399.95
CH-20C	20.0	479.95
AIR CONDITIONERS		
ACH-75, $\frac{1}{2}$ hp., 115 v.	.....	\$279.95
ACH-75L, $\frac{1}{2}$ hp. (low amp)	.....	.....
115 v.	.....	319.95
ACH-75C, $\frac{1}{2}$ hp. casement,	.....	.....
115 v.	.....	349.95
ACH-100, 1 hp., 230 v.	.....	329.95
ACH-150, $1\frac{1}{2}$ hp., 230 v.	.....	429.95

American Motors Reports Appliance Volume Up 18.1% for '55 over '54

DETROIT—American Motors Corp. made substantial progress in 1955 in its competitive drive in the appliance and automobile industries, and reduced its losses during its first full fiscal year, George Romney, president, reported recently.

The company had a net loss of \$6,956,425 for the fiscal year ended Sept. 30, 1955, as compared with a net loss of \$11,071,237 in the previous year. The 1955 loss was after tax recoveries for \$9,700,000. The 1954 loss, which included Hudson's loss for only five months after the merger, was after tax recoveries of \$11,590,000.

Romney said sales of the company's diversified lines of products increased substantially during the year in both the appliance and automobile fields.

Total unit output of appliances, including commercial products, was 18.1% higher in 1955 than in 1954. Household appliances—refrigerators, electric ranges, freezers, and laundry equipment—were up 29%. This gain exceeded the appliance industry increase, it was stated.

The company expects during 1956 to further improve its competitive position in the automobile and appliance industries and to show marked betterment in operating results.

Sales of American Motors for the fiscal year ended Sept. 30, 1955, were \$441,127,272 compared with \$400,343,511 in the preceding fiscal year, when Hudson sales were included for only the five months after the merger.

Net working capital was \$62,407,179 at the close of the 1955 fiscal year, compared with \$82,084,505 a year ago. Cash was \$37,859,347 compared with \$45,402,788 and inventories were \$89,553,762 against \$80,616,002 a year earlier. The corporation had bank loans of \$36,500,000 at Sept. 30, 1955, against its aggregate bank credit of \$73,000,000. Its loans a year ago were \$29,200,000.

Imperial Brass Opens Warehouse In Dallas

CHICAGO—Opening of new warehousing facilities in Dallas, Texas, designed to serve the southwest area on Imperial refrigeration products, has been announced by The Imperial Brass Mfg. Co. here.

The warehouse is located at 9000 Sovereign Row in the new Brook Hollow Industrial District of Dallas.

The new warehouse will carry complete stocks of Imperial refrigeration fittings, valves, driers, liquid indicators, tubing tools, and service tools, and will speed service to these products to distributors throughout the southwest, states C. H. Benson, who is Imperial vice president.

"This represents the first time Imperial has ever maintained a warehouse stock in this area."

The warehouse will be under the direction of Harry Pearson, Imperial district representative, it was announced.

Ranco claims to be the largest supplier of automatic temperature and pressure controls for the refrigeration and air conditioning industries, and produces a major portion of the heater control requirements of the automobile industry.

The company's annual report points out that new products introduced in November include a new series of controls suitable for a wide variety of air condi-

WHAT . . WHEN . . WHERE

— A Guide to Coming Events of Interest

International Home Furnishings Market
Jan. 9-20, Chicago.

National Radio & Appliance Dealers Association (NARDA) Meeting
Jan. 15-17, Conrad Hilton hotel, Chicago.

National Association of Home Builders (NAHB) Convention and Exposition
Jan. 22-26, Conrad Hilton, Sherman, Coliseum, Chicago.

International Heating & Ventilating (ASHAE) Exposition
Jan. 23-25, Sheraton-Gibson, Cincinnati.

Plant Maintenance and Engineering Show
Jan. 23-26, Convention Hall, Philadelphia.

National Frozen Food Convention (NAFFP)
Jan. 29-Feb. 2, Waldorf Astoria, New York City.

The 2nd Canadian Refrigeration & Air Conditioning (CMA) Show
Feb. 1-3, Coliseum, Toronto, Ont., Can.

New Tube Manifold Building Will Triple Manufacturing Facilities

BUFFALO—Purchase of a makes possible a one-floor lay-out 125,000-sq. ft. building formerly occupied by Adesco Industries, 415 Bryant St., N. Tonawanda, N. Y., is announced by Dean M. Rockwell, vice president and general manager of the Tube Manifold Corp. here.

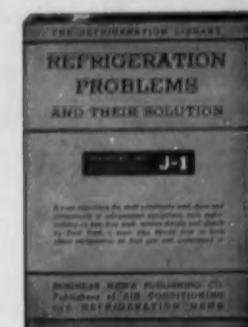
"Acquisition of this new plant providing three times the manufacturing space of the present factory in Buffalo has been necessitated by increased volume of business and introduction of new Tube Manifold products," stated Rockwell.

The North Tonawanda plant

will be in full operation within 60 days. Offices and all manufacturing operations will be moved to the new plant and an increase in employment is anticipated.

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Make it work! When you're stopped by a tough problem use these practical reference books with a load of factual information about every refrigeration problem you'll meet as a serviceman or salesman. For years Paul Reed has been supplying the answers in his weekly column in AIR CONDITIONING & REFRIGERATION NEWS.

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Govt. Air Conditioning--

(Concluded from Page 1, Col. 5) tioning, a G.S.A. official indicated.

This official indicated that the new standard would mean the expenditure of hundreds of millions of dollars on air conditioning in the next few years and possibly billions within the next decade.

The industry committee's recommendations were made, according to its report to G.S.A., to bring government standards in line with modern private industry practice.

Air Conditioning a Must In Block-Type Bldgs.

"What with the increase in lighting intensities and the construction of 'block-type' buildings, designed to get a greater amount of usable floor areas within the dimensions of a given piece of property, air conditioning has in many instances become a 'must,'" the committee declared.

"The aim of an air conditioning system," it said, "is that all the people occupying the space will be unaware of the air conditions—these being neither too cold nor too warm—with the absence of drafts.

"Such conditions are obtained, generally, when the room temperatures are between 76° and 78° F. in summer with a relative humidity of about 45% and 74° to 75° F. in winter with a relative humidity of about 35%.

"Thus, interior spaces—considered as more than 16 or 18 ft. from the windows—must be ventilated to be habitable; and the temperature of these spaces must be held at such a point that the workers therein can be comfortable."

High Post Office Ceilings Boost Cooling Costs

In the case of post offices, the committee noted that their high ceilings boost the cost of air conditioning. It said, "If the post office authorities can devise some method of inspection and supervision which will permit lower ceiling heights in these spaces, the initial cost of the air conditioning installation will be reduced."

For hospitals, the committee recommended air conditioning for special purpose rooms and for patients' rooms where outside wet bulb temperature exceeds 67° F. for 55% of the summer season.

It noted that if money is short, the working parts of the air conditioning system should be installed at the time of construction leaving the refrigerating plant to be installed later.

The committee said that for small or existing buildings,

package and window units have several advantages. It pointed out that they use less space, they can be installed with a minimum disturbance to the tenant, the units can be removed and used in other offices if desired, and they cost considerably less than complete central systems.

The committee would not recommend radiant cooling systems even though results with them have proved very good "because of the greater costs involved."

The committee also recommended individual drinking water coolers be installed rather than a central chilling system.

The committee which prepared the report was headed by Earl H. Lundin, New York City architect. Members were George M. Ewing, Philadelphia archi-

tect; Albert L. Baum, Tage Pearson, and Archie M. Erickson, all New York City engineers; N. J. Pescatore of New York City and John J. McDermott of Washington, D. C., contractors; and Earle Schultz, Chicago building manager.

Amana Will Hold Food Plan Clinic At Winter Market

CHICAGO—Amana Refrigeration, Inc. has announced it would hold a three-times-daily food plan clinic here throughout the Winter Market.

Open to all dealers, the clinic will be held at 10 a.m., 2 p.m., and 4 p.m., Monday through Friday during both weeks of the Market, at Amana's Space 1127 in the Merchandise Mart. Each session will last one hour and will be limited to 20 dealers.

Few New Lines at Chicago Mart--

(Concluded from Page 1, Col. 3) are being withheld for subsequent private showings to distributors.

As "Red" Connell, Norge's vice president in charge of sales puts it:

"When too many retail buyers get a peek at your hand at the Marts, you don't see the color of their money when distributors open the pot in local games."

Although most major manufacturers aren't springing product surprises here, they are sending full quotas of men to interview buyers and get their thinking as to market conditions in various sections of the country.

General Electric men, for example, are eager to get reactions to their new lower-price smaller-discount policy.

Advance predictions from several manufacturers' "advance men" can be summarized as follows:

(1) Household refrigerators are expected to top 1955 sales during 1956 by a modest margin.

(2) Freezer sales should "hang on" in relatively the same position, unless somebody comes up with a successful new promotion gimmick.

(3) Now that "the cats and dogs are washed out" (as one full-line producer puts it, in the mixed metaphor of the week) major manufacturers will pay closer attention to the room cooler business.

"The grief years," he continues, "appear to be over, and now our distributors are showing genuine interest in this product."

There's no "or Equal" when you select... BUSH Air Conditioning Units

EXCLUSIVE INNER-FIN DESIGN • THE INDUSTRY'S MOST COMPLETE LINE

'AH' AIR HANDLING UNITS

Available in 12 models from 800 CFM to 28,800 CFM. Floor-standing vertical and ceiling-hung horizontal models with direct expansion, water or steam coils. Face and by-pass damper sections, mixing boxes, spray type humidifiers and filter sections available for all units. Models AH-10 to AH-32 available with Inner-Fin coils.

'MZ' MULTIZONE UNITS

Available in 9 sizes covering a range from 2,560 CFM to 28,800 CFM. Multizone Units parallel the standard Bush HAH Air Handling units, using the same proven blower sections and accessories such as filter sections and mixing boxes. Zone dividers may be arranged as desired — vertical, horizontal or a combination of both. Entire interior is well insulated and undercoated. Units can be shipped sectionally when this is desired to facilitate installation.

'CR' REMOTE AIR CONDITIONING UNITS

Provide quiet, economical year-round air conditioning for all types of multi-room buildings. Units are available in vertical floor and horizontal ceiling models . . . feature individual room control . . . are easily incorporated in new or existing buildings.

'DX' WATER AND STEAM COILS

Bush Water, Steam and DX Coils are supplied in standardized and matched sizes. Singly or in combination, can be arranged to fit practically any installation. Constructed of collar spaced serrated aluminum fins bonded to copper tube, staggered in direction of air flow.

'IDX' INNER-FIN AIR CONDITIONING COILS

Available in standard stock sizes 2, 3, 5 and 7½ tons for simplified selection. Inner-Fin construction permits use of smaller size coil for any desired capacity. Shallower depth requires less fan horsepower. Coils completely flanged for easy installation.

'CC' COMFORT CONDITIONERS

Engineered and constructed for use in the conditioned area. Motors mounted inside casings. Attractive insulated cases, noiseless operation. Available with direct expansion coils of Inner-Fin construction. Where steam coils are desired, inner tubes of DX coil are specially circuited. Water cooling or heating coils also available.

BUSH MANUFACTURING CO.
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SEE THE LENNOX
AD ON PAGES 14-15